

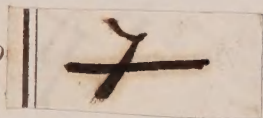


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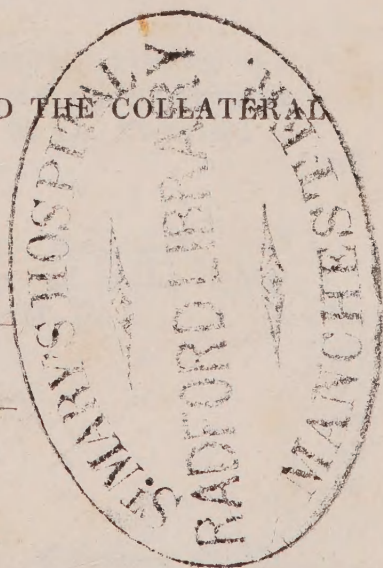


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THE
DUBLIN JOURNAL
OF
MEDICAL AND CHEMICAL SCIENCE;
EXHIBITING
A COMPREHENSIVE VIEW
OF THE
LATEST DISCOVERIES
IN
MEDICINE, SURGERY, CHEMISTRY, AND THE COLLATERAL
SCIENCES.

VOL. VII.



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TO THE PUBLISHERS
OF
THE DUBLIN JOURNAL
OF
MEDICAL AND CHEMICAL SCIENCE.

GENTLEMEN,

I find that the duties of the Professorship of Natural Philosophy to the Royal Dublin Society, added to those of the Chair of Chemistry at Apothecaries' Hall, leave me so little time for the performance of my part in the co-editorship of your Journal, that I have resolved upon resigning that important trust, rather than risk its being indifferently executed.

Having anxiously watched over the infant struggles of the DUBLIN JOURNAL, and seen it, after but a brief adolescence, take a place amongst the Medical Periodicals of Europe, creditable to our country, and highly gratifying to its supporters; a position which I hope to see it long occupy, and to the maintaining of which I shall always be happy to contribute in every way in my power, I terminate my Editorial labours by giving publicity to my resignation, and to the future arrangements of the Journal. The succeeding numbers will be edited by my former colleagues, Dr. Graves, Dr. Stokes, and Mr. Porter.

I have the honour to remain,

Gentlemen,

Your obedient Servant,

ROBERT J. KANE.

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NOTICE TO CORRESPONDENTS.

The Reviews of Dr. M'Cormac's excellent work, entitled "An Exposition of the Nature, Treatment, and Prevention of Continued Fever," and of Dr. Weatherhead's "New Synopsis of Nosology," have been received, and will appear in our next Number.

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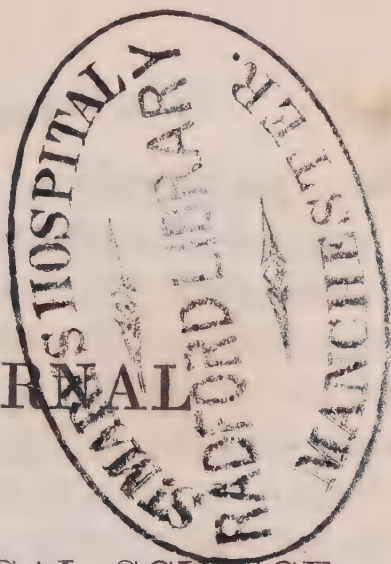
NOTICES TO CORRESPONDENTS.

We regret extremely that the first part of the Cyclopædia of Practical Anatomy and Physiology, edited by Dr. Todd, was received too late for us to insert a notice of its contents among our Reviews. Dr. Todd's well known industry and ability had rendered us very sanguine in our expectations concerning the success of this undertaking; a careful perusal of the first part has removed all anxiety upon this subject, and we now venture to recommend it strongly to our readers.

The Review of Dr. Cowan's Translation of M. Louis's work on Phthisis was received too late for insertion. It will appear in our next number.

The EDITORS of this Journal have great pleasure in announcing, that they have received the cooperation of Doctor CUSACK and Doctor JACOB; and they confidently hope that this important addition to the list of Editors will give satisfaction to the Profession, by rendering the contents of their future numbers more valuable.

THE
DUBLIN JOURNAL
OF
MEDICAL AND CHEMICAL SCIENCE,
1 MARCH, 1835.



PART I.
ORIGINAL COMMUNICATIONS.

ART. I.—*Pathological Remarks on Chronic Abscesses.* By
EPIHRAIM M'DOWEL, M.D., M.R.I.A., one of the Surgeons
of the Richmond Hospital, &c. &c.

CHRONIC diseases of the bones, or of the joints, frequently terminate fatally, by inducing acute inflammation of the serous membranes, or by the formation of purulent depots, in some of the important organs, occurring, as in the brain, lungs, liver, &c.; or purulent infiltration of the cellular membrane may result from long continued, or severe irritation of a mucous membrane, as of the bladder. The three following cases exemplify some of these observations:

CASE I.—Matthew Hughes, aged 28, was admitted on February 14th, 1829, into the Richmond Hospital, with posterior curvature of the dorsal region of the spine, with a psoas abscess on the right side. The disease commenced six years previously, with pain and weakness in the back and loins; at the end of a year swelling took place in the groin, with preceding

uneasiness and stiffness. On admission there was tenderness on pressure of the lumbar vertebræ, the swelling in the groin was globular, tense, and elastic, and was continuous with a similarly tense swelling in the course of the psoas muscle, diminished by the horizontal posture; there was a deep sulcus of the abdomen, bounding inferiorly the epigastric region, and which always accompanies an angular curve of the spine, situate near the first lumbar vertebra; the other symptoms were a sense of tightness across the stomach, paroxysms of dyspnœa, hard, dry cough, debility of the lower extremities, emaciation, night sweats, particularly of the lower half of the body; thirst; pulse 92; uneasiness in the right testis, especially after walking. Caustic issues were inserted on either side of the tender part of the spine: he afterwards had more profuse perspirations at night, flying pains in the abdomen and in the loins.

28th. Pulse rapid and feeble; complained of intense pain in the right side of the chest, with distressing cough; respiration hurried; short and very feeble on the right side. General bleeding to twelve ounces, and a blister applied.

29th. Pain in chest less severe and not so constant; any attempt to make a full inspiration produces coughing; is easier sitting up; respiration under the right clavicle is loud but bronchial. Died next day.

On examination, recent and intense pleuritis was found, a large quantity of lymph was effused on the thin edge and concave surface of the lung; sero-purulent effusion into the chest; recent and acute peritonitis was found also to exist; matting of the intestines, and adhesion of the liver throughout to the diaphragm, and a large quantity of fluid resembling that in the chest; the sac above communicated with the carious bodies of several of the vertebræ, and inferiorly was connected with a round mass of bone contiguous to the lesser trochanter, hollow, and perforated by two openings through which the matter passed. This osseous production was about the size of a tennis ball; the fleshy fibres of the psoas muscle were almost entirely

removed, and the sac was lined by an imperfectly formed layer of lymph; the external iliac vessels were flattened and united to the sac, but were pervious. The compression of the genito-crural nerve explained the neuralgic pains complained of, and which were referred to the testis and thigh.

CASE II.—Cornelius O'Neil, aged 36, admitted April 6th, 1832, “with prominence of the seventh and eighth dorsal vertebræ; lower down, tenderness upon pressure, incipient transverse sulcus of the abdominal parietes, impaired power of the lower extremities, occasional pains shooting from the loins to the lower limbs, muscles flabby: cough and slight mucous expectoration, frequent and troublesome flatulence of the abdomen, impaired appetite, perspirations.” Previous history:—six years and a half since laboured under syphilis, for which he was salivated several times; about the same period pains commenced in the middle and lower part of the dorsal vertebræ with weakness of the limbs; a year since he was thrown from a horse, and this accident was followed by an increase of pain: he has been blistered eight times: cautery was applied on either side of the diseased vertebræ, and the bowels carefully regulated.

May 8th.—Pain extends now along the margin of the false ribs towards the sternum; increased weakness; numbness and coldness of the lower extremities, dyspeptic symptoms also are worse: during the succeeding four or five months, blisters and tartar emetic ointment were applied to the spine without relief. He left the hospital and was not seen until April 4th, 1833, when the following report was made, “increased stiffness of the back; shooting pain from the back down the right thigh; swelling of the right knee joint, with contraction of the leg, from slight synovitis; tense and tympanitic abdomen; appetite failing; bowels regular; urine passed freely. Three months subsequently a lumbar abscess became developed on the right side; small, but tense; ointment of the hydriodate of potash was liberally applied to the tumour, and for one month there was much relief, the tumour appeared to lessen considerably, but again increased, and on examination the abscess was found

to have extended to the inguinal region, forming a swelling internal and inferior to the anterior superior spinous process of the ilium; debility and numbness of limbs increased; tumours and spine rather tender; bowels generally confined; suffered lately from influenza, and since that time, cough, with expectoration, is more troublesome than formerly. I meditated puncturing the abscess according to Mr. Abernethy's plan, but the general want of success following this operation when the vertebræ are diseased, deterred me: a blister was applied to the tumour in the loins, and the surface afterwards dressed with savine ointment; this caused so much local uneasiness, with irritability of the stomach, that the unguentum resinæ, and subsequently poultices, were applied to the blistered surface.

December 5th. Tongue white and furred; ardent thirst; constant vomiting; distended abdomen; tympanitic; not tender on pressure; pulse 130, and soft. Pills of calomel and opium; effervescing draughts, and an enema in the evening.

6th. Insomnia; nausea constant, and severe retchings; hiccough; severe headach; pulse 120, feeble; cephalalgia; thirst continues; bowels free; urine high-coloured; dyspnœa; pain referred to the region of the diaphragm; mucous rattle; had profuse perspiration during the night; face covered with a cold clammy moisture; sunken look; prostration of strength. A mustard cataplasm was applied to the epigastrium; thirty drops of laudanum in an enema, and the following directed:

℞ Mist. Camph. ℥vi.
 Ætheris Sulphurici ℥iss.
 Spir. Ammonizæ Aromat. ℥iss.
 Tinct. Opii gutts. xl. ℥
 Sumt. Coch. amph. duo 4ta hora.

7th. The sinapism did not act; bowels free; urine nearly of the colour of blood; cessation of vomiting; occasional singultus; pulse very rapid, upwards of 144, and still feeble, though less so than on yesterday; profuse perspirations; respiration twenty-four in the minute, and jerking; occasional cough, with mucous

rále, continues ; headach ; looks are still more depressed. Sinapisms directed to the feet.

8th. No sleep last night ; some raving ; tremors ; other symptoms as yesterday, more debility.

Vesicatorium inter scapulas.

Sinapisms repeated, an emollient enema, and four ounces of wine with water.

9th. Constant moaning and raving during the night ; pulse rapid and thready ; looks more depressed ; eyes glazed ; insatiable thirst ; mucous rále louder and more diffused over the chest. Died this day.

On examination, there was found enormous flatulent distention of the cæcum ; the colon was doubled on itself below the right lobe of the liver, and descended very low to form the transverse arch ; the vermiform appendix was united by old and firm adhesions to the cæcum ; the right kidney was displaced, and pushed forwards by the psoas abscess ; liver soft, flaccid and pale.

Thorax.—On the right side intense and recent pleuritis, with purulent effusion, the inflammation was particularly acute below, where lymph in large quantity was poured out between the pericardium and lung, and between the latter and the diaphragm : the left lung was throughout firmly connected to the parietes of the chest, by old adhesions ; bronchitis, two ounces of serum in the pericardium.

The pleuritis in this case was overlooked ; no pain in the chest was ever complained of, uneasiness was referred to the epigastrium, and the constant vomiting led me to believe that the cause of irritation was below the diaphragm, and that it was connected with irritation of the sac of the abscess, consequent upon the application of the blister to the lumbar tumour.

CASE III.—*Stricture, Cellular Inflammation, &c.*

Edward Langan, aged 33, admitted January 14th, 1828, with a tight stricture of the urethra at the bulb, of nine or ten

years' duration: he had suffered from gonorrhœa repeatedly, and had used stimulating injections; there was much constitutional disturbance, dysuria, and irritability of the bladder.

January 20th. Diarrhœa and fever.

26. Fever unabated; urgent thirst; pain above the pubes, in the loins, and along the course of the urethra to the glans penis; complains also of severe muscular pains in both upper and lower extremities, referred to the muscles; urine and stools occasionally voided involuntarily; diarrhœa checked; pulse varies during the day from 108 to 130; fulness of the abdomen.

31st. Return of diarrhœa; muscular pains worse; pain in the loins very severe; abdominal tenderness; night sweats.

February 2nd. Less diarrhœa; discharges from the bowels purulent; tongue clean; pulse 138; sunken countenance; high coloured urine; pain in left side of the loins very severe, occasional rigors and profuse sweating.

14th. Diarrhœa more profuse; pains better; pain extends from the loins down the outside of the left thigh: until the 26th there was but little change; diarrhœa, lumbar, and muscular pains continued, with a rapid small pulse, and the urine clouded with shreds of lymph. On the 26th, a large abscess was discovered under the left glutæus maximus, and a large quantity of healthy pus evacuated by free incision; between this period and the 4th of March, two other large abscesses became developed, one under the right deltoid, and the other under the left pectoral muscles, accompanied with repeated rigors; ardent thirst, purulent diarrhœa, &c.

8th. Teasing dry cough; pulse 120; profuse discharge from the abscesses, with diminution of the diarrhœa and dysuria.

11th. Pulse 156; lower limbs anasarcaous.

13th. A considerable quantity of pus flows from the right ear; died next day.

On examination, there was found much sero-purulent matter

in the abdomen, with matting of the intestines; minute vascularity of the surface of the small intestines, with vascularity of the corresponding parts of the mucous membrane; numerous ulcers in the large intestines of varied sizes and depth, and much purulent matter. In part of the sigmoid flexure of the colon lymph coated the mucous surface; there was also a recent effusion of lymph on the convexity of the liver, and on the middle third of the rectum; the bladder was hypertrophied, vascular, and contracted, a gelatinous-like lymph was adherent to the trigone vesicale; a large abscess existed between it and the side of the pelvis and between the bladder, vesiculæ, and rectum; the cyst was dark and firm, the parts were all matted together by lymph, which was effused in large quantity about the prostate and vesiculæ. The kidneys were large and flaccid; the fibrous capsule very vascular; the renal structure pale, like fibrine; ureters enlarged; mucous membrane inflamed, and bands stretched across the canal; the stricture at the posterior part of the bulb was close and very firm; thickening and induration of the corpus spongiosum, near the contraction; the pelvic lymphatic glands enlarged and hardened.

ART. II.—*Researches on Instrumental Delivery*. By F. CHURCHILL, M. D., Licentiate of the King and Queen's College of Physicians in Ireland, Physician to Wellesley Institution for Females, and Lecturer on Midwifery, &c., in the Medico-Chirurgical School, Digges-street.

(Read before the College of Physicians, January 19th, 1835.)

MR. PRESIDENT,

NOTHING is more conspicuous in the advance which the science of midwifery has made in latter years, than the diminished frequency of instrumental operations; and this arising, not from any alteration in the *conditions* of parturition, but from our more correct estimate of the *powers* employed. Natural labour

consists in a equable adjustment of the power (uterine contraction, &c.) to the two conditions, and of a just adaptation of these conditions, (the passage and the body to be passed through it,) the one to the other. Inequality in either of these will cause more or less deviation from the natural course of labour, and upon its extent depends the natural or artificial completion of delivery ; and as it is by an estimate of these circumstances that our conduct must be guided, it is evident that our practice will be judicious, in proportion to the extent of our knowledge. In the present state of the science, it is difficult to say how far improvement in this respect may be carried ; but it is clear, that there must always remain certain cases in which aid will be required, and in which there may arise a question as to the instrument to be used. There is in addition a class of complex labours, for the termination of some of which, assistance has usually been deemed necessary.

The most useful and most important of the instruments in present use, are undoubtedly the forceps and crotchet. As they are directly opposed in their nature and in the results of their application, they have been the subject of repeated investigation ; in all the comparisons drawn between them, the well-being of both the parties concerned (the mother and child) has been regarded, and the preference has been generally, and with justice, given to the forceps, as affording a chance of life to the infant, with equal safety to the mother. It would be tedious to give extracts from authorities to prove this, any person versed in obstetric literature will recognize it as the opinion of most of the best writers on this subject, and it will be further evidenced by the comparative frequency of the two operations, of which I shall submit a tabular view presently. I am not aware, however, that any one has made extensive investigations as to the comparative results to the mother of these two operations, and as such a comparison illustrates and enforces some important points in midwifery, I trust I shall not be trespassing too

largely on your patience, if I detail some researches I have made on this subject.

Labours requiring the interference of art, may, as regards our present object, be divided into three classes. In two of them, the species of assistance necessary is clearly indicated, but in the third, it is left in doubt; for instance, when the *obstacle* arises from the suspension or cessation of uterine action, or from mischievous excitement setting in, the passage being sufficiently ample to permit the transit of the child, the substitution of an extractive force for the expulsive effort is manifestly all that is required. Again, when the distortion of the pelvis is so great, as to prohibit the passage of the head of the child, the delivery must be accomplished by lessening it. But in cases of the third class, which is by far the most extensive, considerable hesitation must often be felt, and the varying practice of different accoucheurs shews this very plainly. In these cases, the mother is in extreme danger; her only chance is in a speedy delivery. In some cases, the consideration of the child weighs but little, in many not at all, from the almost certainty of its death. The accoucheur then feels himself justified in regarding chiefly the welfare of the mother, and, *a priori*, we might suppose that diminishing the bulk of the child would best insure it. Thus some have thought and practised; others have wished to afford a chance of life to the infant, and on this ground have used the forceps; not that the probability in favour of the woman appeared greater—hardly so great, but that their plan combined the two objects; whereas the other was limited to one. These cases are principally where some disproportion exists between the head of the child and the passage, so as to render the uterine efforts inefficient; where fever or inflammation sets in, or where there is great exhaustion; where similar effects result from the malpresentation or malposition of the head, or where the child is hydrocephalic;

in cases of fainting, hæmorrhage, or convulsions; where tumours obstruct the passage, or where its calibre is diminished by deformity of the pelvis, but not to any great degree; or where the child is supposed to be dead. Now, if we consider the safety of the child, as well as that of the mother, we shall assuredly hesitate before we use the perforator in most of these cases; but even if the child be put out of the question entirely, it may still be doubted which is the safest operation for the mother. Thus, in every case we are met by great difficulties, and it is in hope of contributing to the solution of some of them, that I have endeavoured to discover the proportionate fatality to the female, of each operation.

I may as well anticipate two objections, which will be made at the outset against such a comparison. In the first place, it will be said, 'that from the different circumstances demanding the one or the other operation, no fair comparison of their results can be made; and secondly, that the period of labour, at which an operation is performed, will greatly influence the result; and if this be different for those in question, a comparison will be unjust.' As to the first objection, I would observe, that from the prejudices of education, and other circumstances, there is scarcely any peculiarity requiring the crotchet, in the opinion of some accoucheurs, for which the forceps have not been deemed sufficient by others, and *vice versâ*. An eminent German, whom I shall quote hereafter, used the crotchet once and the forceps 300 times, and yet his forceps cases were not more fatal than Dr. Joseph Clarke's crotchet cases, though they presented in many instances similar characteristics. In fact, if we take the whole number I have adduced, we shall find, that, with the exception of the cases of extreme pelvic distortion, there is no regularity in the employment of either instrument, some using the forceps, and in similar cases others employing the crotchet. Besides, the cause of death is generally some affection, local in its origin, and the local cause, viz., the transit of a large body through a passage somewhat too small, is com-

mon to both. Equal injury may be inflicted by the extraction of a head emptied of its brain, and of an entire head, if they bear the same relation to the calibre of the passages: this is proved by the mortality attending crotchet operations. As to the second objection, both operations have been performed at every period of labour, when once the necessity has been established. In the cases referred to, the instruments were sometimes used at an early period, at other times later. In this country, when not demanded by accidental complications, neither is adopted until the lapse of twenty or twenty-four hours has proved the inefficiency of the natural efforts. On the Continent, the term varies much, but equally in both cases as far as I have ascertained. As then neither the cases requiring either operation, nor the time when either instrument should be used, is definite, and as the uncertainty is pretty equal in both cases, I think the objections are greatly weakened in force, if not invalidated. In the following statements I have endeavoured to be as accurate as possible: I shall gladly correct any mistakes; and that they may be discovered, if there are any such, I will briefly indicate the sources of my information. I have examined upwards of thirty systems of midwifery, English and French, and from them I have extracted their calculations, or else, from the cases there given, I have formed tables for myself. It is much to be regretted that our standard works on midwifery are so deficient in details of this kind; indeed, as some of them state, they all seem to consider both operations perfectly safe for the woman, and they caution us only against dangers arising from awkwardness. I have found the reports of lying-in hospitals very useful, when they were sufficiently minute; but, as will be seen, some of the British, and all the French, appear to have overlooked the necessity of noticing separately the results of operations. The German reports which I shall give are very accurate, and many particulars are subjoined, which my object did not require that I should ex-

12 Dr. Churchill's *Researches on Instrumental Delivery.*

tract. They are all to be found in the thirteen volumes of Siebold's Journal of Midwifery.

The first table I shall shew, exhibits the number of these operations, and their relative frequency in Great Britain and on the Continent.

DATE.	INSTITUTIONS, AUTHORITIES.	TOTAL NO. OF CASES.	FORCEPS.	CROTCHET
1765	Smellie calculates that in .	1000	there will	be 6 ope-
1781	Westminster General Dispensary, Dr. Bland,	1897	12	
1793	Dublin Lying-in Hospital, Dr. J. Clarke, in seven years,	10.387	17	49
1806	Dublin Lying-in Hospital, Dr. Breen, for six years,	11.696	in all 44	operations.
1825	In private practice, Dr. Merriman,	2947	21	9
1828	{ Wellesley Dispensary, Drs. Cusack and Maunsell,	1268	31	6
1832				
1833				
1809	Maison d'Accouchments, Paris, Dr. Baudelocque,	17.308	49	13
	Maternité. Mad. Lachappelle, .	22.243	76	12
1817	Hospice de la Maternité, Paris, Mad. Boivin,	20.517	96	16
1829	Velpeau,	once	in 200	cases.
1812	Lying-in Hospital, Vienna, Dr. Boer,	18.642	35	13
1811 to 1827	{ Prague Lying-in Hospital, Messrs. Moschner and Kursak,	12.303	120	4
1814 to 1827				
1819	{ Dresden Lying-in Hospital, Dr. Carus,	2549	184	9
1819	Lying-in Hospital at Geissen, Dr. Ritgen,	103	10	1
1824 1825 1826 1827	{ La Charité, Midwifery Hospital, Berlin, Dr. Klugè,	1111	68	6

TABLE—*continued.*

DATE	INSTITUTIONS, AUTHORITIES.	TOTAL NO. OF CASES.	FORCEPS.	CROTCHET
1825	{ Lying-in Hospital at Cologne,	295	19	4
1826				
1825	{ Midwifery Institution at Breslau,	356	7	3
1826				
1825	{ Midwifery Institution at Trier,	51	3	0
half of 1826				
1825	{ Lying-in Hospital at Dantzick,	380	23	0
1826				
1827				
1828				
	Heidelberg, Naegelè,	1711	55	5
1826	{ Midwifery Hospital, Magdeburg,	29	3	2
half of 1827				
1827	{ Royal Lying-in Hospital, Bres-	368	8	2
1828				
1829	{ Midwifery Institution, Fulda,	144	0	1
1831				
1830	{ Lying-in Hospital, Marburg, Dr.	340	35	1
1831				
1832				
1833	{ Royal University Lying-in Hos-	2093	300	1
to 1828				
	He used the forceps	for	crotchet	cases.

Thus among British practitioners, the number of operations compared with the number of cases are 167 in 29,195, or about 1 in 174. In 16,499 cases there were 53 requiring the forceps, or about 1 in 311, and 64 requiring the crotchet, or about 1 in 257.

In the estimates given by French authors we have 59,908 cases, and 262 operations, or about, $1\frac{1}{2}$ in 238. The forceps were used 221 times, or nearly in the proportion of 1 to 271.

There were 41 crotchet cases, or about 1 in 1461. The relative frequency of the two operations is about one crotchet case to five forceps cases.

In Germany the number of operations, compared with the total number of cases, were 922 in 40,475, or about $1\frac{3}{4}$ to 43. Omitting Siebold's cases, the number of forceps cases are 570 in 38,382 cases, or about $1\frac{1}{4}$ in 67; and the crotchet cases in the same number amount to 51, or about 1 in 752.

According to this calculation, we observe an increasing number of forceps operations, and a decrease in the number of perforations. Our further researches will tend to shew whether this change has been an advantage or not.

The first author from whom I have obtained any data for the present calculation is Dr. Smellie, who published (the edition of his works I possess is dated 1765) a collection of cases illustrative of his treatise on midwifery. He relates fifty-two cases in which the forceps were used; two women died, the rest recovered; forty-four of the children lived. One or two of the women who got well had inflammation of the vagina, and in one case the perinæum was lacerated. The grounds of interference were exhaustion, deficient uterine action, hæmorrhagies, convulsions, malpositions, malpresentations, narrowing of the passages, and unusual size of the child's head. He seldom (except in hæmorrhage or convulsions) operated before twenty-four hours had elapsed. He describes also twenty-four cases delivered by the crotchet, generally on account of the disproportionate size of the child. Three of the patients died soon after the operation, and in addition, two recovered contrary to expectation, and had one the perinæum torn. Some of the children were putrid, and of course all were lost.

In 1782, Mr. Perfect, a surgeon, published two volumes of cases in midwifery, in which he mentions seventeen cases where the forceps were used. Of these fifteen women recovered, and two died from puerperal fever. Of those who recovered, two were likewise attacked with fever, two continued weakly after

hæmorrhage, and in two the perinæum was slightly injured. The operations were undertaken in consequence of exhaustion, malposition, convulsions, hæmorrhagies, narrowness of passage, rigidity, &c. &c. The operation appears in many cases to have been deferred too long ; two children were born dead, and two died some days after delivery ; thirteen lived. Three crotchet cases are related, from malposition, pelvic distortion, and hydrocephalus ; one woman recovered well, two with difficulty, and all three suffered from incontinence of urine for some time.

In 1793, Dr. J. Clarke published his abstract of the Report of the Dublin Lying-in Hospital. He used the forceps fourteen times ; two were cases of convulsions, and died, and one who recovered had laceration of the urethra. I conclude that the remainder recovered, as no mention is made of the contrary. For the same reason I shall mark down the children as all alive. He employed the crotchet forty-nine times, and sixteen women died.

Dr. Breen, in his report for six years, published in 1806, describes forty-four instrumental operations without specification ; of these twenty-six recovered and eighteen died.

Dr. Merriman (1826) gives a tabular view of twenty-one forceps cases, and nothing being said to the contrary, I conclude the women all recovered. Fifteen children were saved and six died ; three of which were putrid, and two occurred in women in convulsions. He also relates nine crotchet cases, and from his silence I shall equally conclude that all the women recovered.

Dr. Gooch (edit. of his Lectures, 1831) relates six cases in which the forceps was used, (the *long* forceps in two of them) ; one woman died and five recovered, one of whom had the perinæum lacerated.

In the report of the Coombe Lying-in Hospital (1828) Mr. Gregory mentions having used the crotchet three times. One woman died from sloughing of the cervix uteri and adjoining

parts, another with abscesses in the uterus and inflammation of the bronchial tubes, and the third, with whom the forceps had been first tried and had failed, recovered perfectly well.

In three annual reports of the Wellesley Lying-in Institution, (1828-32-33,) by Drs. Cusack and Maunsell, the forceps were employed twice; both women recovered and one child. There were seven crotchet cases; three women died, (two of peritonitis,) one was threatened with peritonitis but recovered, and three recovered well: with one of these the forceps had been tried and failed.

During the present year (1834) at the Wellesley Dispensary, another case occurred under my care where the forceps was used under unfavourable circumstances. The patient had a severe attack of matritis, but recovered: the child had been dead some hours. I have also used the crotchet once this year after the forceps had failed, and the woman recovered without a bad symptom.

In the Transactions of the Association of Members of this College for 1830, the late Dr. Beatty states, that he used the forceps or lever in 111 cases during forty-two years, five of which were spent in the Lying-in Hospital of this city. None of the mothers died—none had lacerated perinæum, and all the children supposed to be alive at the time of operating, were delivered safely. He used the crotchet but three times in twenty-six years, and as nothing is said, I suppose successfully.

Dr. Ramsbottom, in his excellent work, (1832,) describes five forceps cases arising from exhaustion, slight narrowing or malposition, and in all after the labour had lasted twenty-four hours. All the women recovered well, but one who had sloughing of the bladder; two of the children were still-born, the remainder were alive and well. He also relates nineteen crotchet cases: of these eleven recovered speedily, three died, (two with sloughing of the passages,) three recovered from a state of great danger, one after a febrile attack, and one had recto-vaginal fistula.

In private practice I have used the forceps twice: both patients recovered, one of them after an attack of matritis; both the children are alive now.

No details suited to my present purpose are to be found in Baudelocque, Boivin, Capuron, or Velpeau: the latter remarks that the operation by the crotchet is extremely formidable and dangerous to the mother.

Madame La Chapelle relates seventy-nine forceps cases; sixty-five women recovered; fourteen died, generally of peritonitis. Some cases were delayed too long; in some the pelvis was deformed; in one the perineum was lacerated, and several times the obstacle was at the superior outlet; fifty-six children lived; twenty-three were lost, some of whom were putrid when born. Madame L. used the crotchet sixteen times; ten women recovered, and six died, generally of peritonitis; the labours had not been specially long. Several of these were footling cases, or cases in which version had been performed.

I pass now to some particulars obtained from different reports of midwifery hospitals in Germany, as given in Siebold's Journal. To prevent unnecessary repetitions, I may as well at once enumerate the circumstances, which, in the opinion of the accoucheurs, demanded instrumental assistance:—absence of pains for a considerable period, exhaustion, malposition, malpresentation, hydrocephalic head, convulsions, hæmorrhage, narrowing of the passage, and (if not very considerable) distortion of the pelvis: all were aided by the forceps. Extreme distortion, and in one or two cases, enormous hydrocephalic heads alone seemed, in their opinion, to justify the use of the crotchet. E. Siebold, of Berlin, carried this rule still further; he actually used the forceps in all cases of difficulty; he mentions but one crotchet operation.

In three years, 1789, 90, 91, at the Vienna Lying-in Hospital, Boer used the forceps nineteen times: seventeen women recovered, two died; fourteen children were saved. The head was

perforated eight times ; some of the women died, but the number is not specified.

At the Royal University Lying-in Hospital, Berlin, during ten years, Elias Von Siebold tells us the forceps were used 300 times : eleven women died, and three or four recovered from an attack of matritis ; forty-seven children were lost, some of them had been dead some time. In one crotchet case, the woman recovered.

At the midwifery hospital at Geissen, (in 1819,) Dr. Ritgen employed the forceps ten times : only one woman died ; one child was dead born, and one died a few days after birth ; all the rest were saved. The crotchet was used once ; the mother recovered.

In the report of the Dresden Lying-in Institution, in 1824, Dr. Carus relates thirteen forceps cases : twelve women recovered, and one died from puerperal fever ; ten children were saved. There were no crotchet cases.

At La Charité Lying-in Hospital, Berlin, during the years 1824-25-26-27, Dr. Klugè used the forceps sixty-eight times : all the women recovered well ; fifty-four children were saved, and of the fourteen lost, several were putrid. The crotchet was used eight times, and three women died ; two of those who recovered were attacked with inflammation.

Professor Andrée operated seven times with the forceps in the Midwifery Institution at Breslau, in the years 1825-26 : one of the women died ; five children were lost, all the rest did well. He used the crotchet twice, and one woman died.

At the Midwifery Hospital at Dantzic, during the years 1825-26-27, Dr. Brunatti employed the forceps twenty-four times : twenty-three women recovered, and eighteen children were saved. No crotchet cases.

During 1825-26-27, in the small Lying-in Institution at Trier, Dr. Theys met with three forceps cases : all the women recovered ; one child was dead. The crotchet was not used.

At the midwifery hospital in Prague, from July, 1811, to

August, 1827, according to Messrs. Moschner and Kursak, the forceps were used 120 times: no instances of failure as regards the mother are mentioned; the number of children saved is not given. Of four crotchet operations, one proved fatal.

During the winter session of 1826-27, at the Magdeburg Lying-in Hospital, Dr. Voigtel operated three times with the forceps, with success as to both women and children.

At the Royal Lying-in Hospital, Breslau, in the years 1827-28, Dr. Küstner employed the forceps eight times: three women died; one recovered slowly and four rapidly; three children were lost. There were two crotchet cases, and both the women recovered.

In 1829, Dr. Adelman, at the midwifery institution in Fulda, having failed in delivering a patient with the forceps, employed the crotchet with success to the mother.

During the years 1829-30-31-32-33, at the Lying-in Hospital at Marburg, (Caspar Siebold,) there were thirty-five forceps cases: thirty-three women recovered, and two children only were lost. There was one crotchet case; the women recovered after severe illness.

DATE.	PLACE.	AUTHOR.	NO. OF FORCEPS CASES.	NO. OF WOMEN.		NO. OF CHILDREN.		NO. OF CROTCHET CASES.	NO. OF WOMEN.		NO. OF CHILDREN.	
				Living.	Dead.	Living.	Dead.		Living.	Dead.	Living.	Dead.
1765	London,	Smellie,	52	50	2	44	8	24	21	3	24	3
1782		Perfect,	17	15	2	13	4	3	3		3	
1793		Jos. Clarke,	14	12	2	14		49	33	16	49	
1826		Meriman,	21	21		15	6	9	9	2	9	
1828		Gregory,						3	1		3	
1828 32-33	Dublin,	Cusack and Maunsell,	2	2		1	1	7	4	3	7	
1830	Do.	Beatty,	111	111				3	3		3	
1831	London,	Gooch,	6	5	1			19	16	3	19	
1832	Do.	Ramsbotham,	5	5		3	2	1	1		1	
1834	Dublin,	Churchill,	3	3		2	1	1				1
1789-90-91	Vienna,	Boer,	231	224	7	92	22	118	91	27	118	
1819		Ritgen,	19	17	2	14	5					
1824		Geissen,	10	9	1	9	1	1	1		1	
1824 to 1827		Dresden,	13	12	1	10	3					
1825-26		Berlin,	68	68		54	14	8	5	3	8	
1825-26-27		Klugé,	7	6	1	2	5	2	1	1	2	
1825-26-27		Trier,	3	3		2	1					
1825-26-27		Dantzick,	24	23		18	6					
1811 to 1827		Prague,	120	120	1							
1826-27		Magdeburg, Voigtel,	3	3		3		4	3	1	4	
1816 to 1828	Berlin,	El. Siebold,	300	289	11	53	47	1	1		1	
1827-28	Breslau,	Küster,	8	5	3	5	3	2	2		2	
1829	Fulda,	Adelmann,						1	1		1	
1829 to 1833	Marburg,	C. Siebold,	35	33	2	33	2	1	1		1	
	Paris,	Lachapelle,	79	65	14	56	23	16	10	6	16	
		Total	920	877	43	351	132	154	116	38	154	

British.

German.

French.

Thus we see, that out of 920 forceps cases, 43 died, or about $1\frac{1}{3}$ in 21 ; of 154 crotchet cases, 38 died, or about 1 in 4. And it is now evident, that the more extensive employment of the forceps of late years, which was noticed before, is unquestionably an advantage, inasmuch as more recover from its use than after perforation has been employed.

I have already shown, that of the women who recovered, many suffered from fever, matritis, and inflammation of the passages ; these attacks were about equally frequent after each operation. It will be noticed, that I take it for granted, that the women recovered after either operation, when no mention is made of the contrary. This, I conceive, I am justified in doing, from the opinion these same authors hold of their safety, and from their express mention of other cases which proved fatal. Of 386 children delivered by the forceps, scarcely three-fourths were saved ; of those which were lost, several had been dead some days, and were putrid. Some allowance for this great mortality must also be made, on account of the frequency with which the forceps were used in Germany, in cases which are delivered by the crotchet in this country. I merely at present mention these facts respecting the children, without laying stress upon them, as the object of this paper is to relate the results of these operations, as far as the mother is concerned.

1. From the foregoing details, we are necessarily led to several important conclusions. In the first place, neither operation is so innocuous to the mother, even in skilful hands, as has been supposed, and on this point, the statements of many of our best authors on midwifery are deficient, as well as in merely guarding the student against awkwardness in the use of instruments.

2. From the much greater mortality following the use of the perforator as regards the female, we are not warranted in using it, except in cases of great distortion, when no hope of delivery would be afforded by the forceps.

3. Except in cases of great distortion, the crotchet should never be used, until we have ascertained by trial that the forceps are unequal to the delivery. This observation is confirmed by several cases I have mentioned, where the forceps were tried and failed, and the crotchet had to be employed; all these cases recovered. The previous attempt with the forceps, therefore, added nothing to the danger.

In this respect our calculation has confirmed the advice of many distinguished writers, as Foster, Osborn, Smellie, Mackenzie, J. Clarke, Denman, Burns, Dewees, Lachapelle, &c. &c. Denman says, "when there are signs of imminent danger, however averse we may be to the use of instruments, we may be induced to try the forceps, though the case might not be altogether such as we might choose for their application, merely to take a chance of saving the life of a child, which must otherwise be inevitably lost."

Burns observes, "slow, persevering, careful trials must be made, and I beg, that as the practitioner values the life of a human being, and his own peace of mind, he will not desist and have recourse to the crotchet in cases at all doubtful, until it has been well ascertained that neither the lever nor forceps could be used." Dewees remarks, "it is certainly within our recollection, when cases similar to those which are now almost universally relieved with the forceps, were as certainly treated by the crotchet; the child a certain victim, the mother a probable one."

Maygrier anticipates the entire disuse of the crotchet, and Siebold, as we have seen, nearly dispensed with it. These observations apply not only to cases where the head of the child is in the pelvis, but according to many authors, even when it is still above the brim. In such a case, they recommend the long forceps as supplying the place of the crotchet. See Smellie, Hamilton, Conquest, Blundell, Dewees, Baudelocque, &c. &c. &c.

4. From the mortality attendant on the safest operation, (the

forceps) may we not draw an argument for its early performance, as affording a greater probability of a favourable termination.

5. Some authors (Baudelocque and others) have made the death of the child a reason for the use of the crotchet, and recently the use of the stethoscope has been recommended for the purpose of ascertaining this, with the confessed object of deciding the period of this operation. It will, I think, now be pretty clear, that except in cases of extreme distortion, the death of the child ought to have no influence upon the kind of instrument to be employed; that a regard for the safety of the mother alone, requires, at least, that an attempt be first made with the forceps.

ART. III.—*Cases and Observations*. By a Country Practitioner.

No. I.

TO THE EDITOR OF THE DUBLIN JOURNAL OF MEDICAL AND CHEMICAL SCIENCE.

“Dungarvan, 10th December, 1834.

“SIR,

“The ensuing series of cases and observations are offered through you to the public, not that I conceive there is any thing new or very uncommon detailed, but because I think that in practice no two cases will be found identical; and that if I faithfully *record*, even though I should falsely *infer*, benefit will arise to some part of the profession. Should the following meet with your approval, I hope to continue the series at some future period.

“Your obedient Servant,

“THOMAS CHRISTIAN.”

SPITTING OF BLOOD.

I WAS called about eight o'clock, A.M., to see a lady thus affected. She was middle-aged, delicate looking, and the

mother of a large family. She awoke about five o'clock, A.M., with what she called a "spitting of blood." Her usual medical attendant soon arrived, and proceeded to administer the aromatic sulphuric acid, but without any immediate benefit. I saw her at nine o'clock, A.M.; she was pale, weak, and a good deal alarmed, but quiet and resigned; her pulse were frequent, but firm; the quantity of blood lost had not been great, but she was not a person likely to bear much loss without immediate danger or subsequent injury. To my particular inquiries as to the manner of the loss of blood, I received a very decided opinion from all parties, and particularly from the patient herself, that it had been *vomited*. Two basins, each containing some of the ejected blood, were exhibited to me: the blood was not frothy and florid, as from the lungs; it was coagulated, in one basin dark coloured, in the other more florid: there did not seem to be in either any of the usual contents of the stomach. We gave her some pills of acetate of lead and opium, and ordered coolness and absolute rest, &c. After some time I became convinced, by observing the effortless way in which the hæmorrhage was taking place; the constant and almost *guttatine* manner in which it flowed; that it did not come either from the stomach or the lungs, but must proceed either from the mouth, pharynx, or œsophagus. If the bleeding was taking place in the posterior nares, or upper part of the pharynx, some of the blood would, in all probability, have come through the nose, when the patient lay on the side or raised herself. However, as she positively insisted on the fact of having, more than once, *vomited* the blood, and as there was no very urgent cause for immediate interference, we delayed the examination of the mouth till the arrival of another medical gentleman, who had been sent for at the same time that I had been, but who, living at a distance, was not yet arrived. By the time of his arrival, I was more sure than ever, that the hæmorrhage was from the mouth or pharynx, and that the blood vomited had been previously swallowed, during sleep. We proceeded to examine

the mouth, when, after having it well washed out, it was soon evident, that the blood proceeded from the sockets of two of the lower incisor teeth which were loose. Of course, after their extraction, it was easily suppressed.

This case, I think, very instructive to junior practitioners, who are too apt to heap Ossa over Pelion, and magnify their own difficulties, by regarding that as great which is often in itself but trivial. Had I, in the first instance, proceeded to examine the mouth, I might have at once ascertained the sources of the hæmorrhage, and relieved my patient and her amiable family from all anxiety: but, depending on the opinions of those around me, my inquiries were made chiefly with a view to determining whether the lungs or stomach was the seat of the hæmorrhage; and when, after observing its progress for some time, I became convinced, that neither was the affected organ, I felt bound to await the arrival of the other medical man, lest through a misconception of mine, my patient should be subjected to unnecessary and injurious disturbance. I at first supposed, that the blood came from the stomach, because it was in large coagulated masses, of a dark colour, and brought up by vomiting. In one basin it was rather florid; but this had been the first rejected, and had consequently been exposed to atmospheric action. The bronchial membrane would not have allowed it to collect in such quantities; but the mucous membrane of the stomach, not being possessed of such irritability, usually permits a very considerable accumulation; this will generally be found, whether the blood be arterial or otherwise, of a dark venous character, owing to the state of rest in which it lies, and to the absence of contact with atmospheric air. On the other hand, blood from the lungs would have been brought up by coughing; in smaller quantities at a time, and instead of being in solid coagula, it would have had a frothy appearance, owing to its impregnation with bubbles of air, which would also cause it to appear florid, even although originally flowing from a vein, by the extent of surface thereby presented to atmospheric in-

fluence. There would also, probably, have been a mucous *râle* present. Now none of these circumstances existed. She had, during several hours, vomited twice in considerable quantity; the bronchial membrane would not have endured the presence of a foreign body for half the interval, and the quantity would have been almost sufficient to have destroyed respiration if it had accumulated in the pulmonary tubes. Now there are two other useful diagnostics of hæmorrhage from the stomach which were absent. I could not detect in the ejected blood any of the usual contents of the stomach; this, however, may be in some degree accounted for, by recollecting the hour at which the first symptoms took place: at five A.M. The other symptom to which I allude is, the occasional co-existence of the blood in the stools; I say *occasional*, because this is by no means constant; the blood may be digested in part, and undergo such alterations in its passage through the bowels, as not to be recognizable in the evacuations. However, in this case the period was perhaps too short for any such appearance, and at all events I could not have judged, as there was no stool until afterwards, and by that time my views were greatly modified by observation of the case. Here was a case which, superficially regarded, presented all the characters of hæmorrhage from the stomach, except the two last mentioned, and their absence was perhaps merely fortuitous. A lady, dreaming probably, chops her teeth together and sets the bleeding going; she swallows a quantity of blood during sleep, and is awaked by sickness of stomach and vomiting: there are here many liabilities to deception, which can only be avoided by a calm and deliberate consideration of the symptoms. In the above observations, I have alluded to some of the principal diagnostics of hæmorrhage from the lungs and stomach, but it is not always an easy matter to distinguish between them, and the young practitioner should never forget, that there are cases on record, where after death from *vomiting* of blood, dissection has shewn, that this fluid proceeded originally from the lungs, and entered the stomach by some fistulous communication. The

case I have is by no means a solitary example of mistakes of this kind: such errors have occurred even in the practice of men deservedly ranking high in the profession; it should, therefore be a warning to every man, and particularly to every young man, to inquire diligently into all circumstances and symptoms, and not to rest satisfied with the impressions of those about the patient, till he has, as far as he can, investigated the matter for himself.

MONOMANIA.

A young female, aged about twenty years, unmarried, had become low spirited after exposure to some depressing circumstances. This state continued for some time increasing, without, however, any very definite symptoms of ill health, beyond a general *mal-aise*. Gradually, (being of a very religious turn), she began to experience a most unaccountable dread on the score of her salvation. This continued to increase till it attained a miserable extent. Her menstruation, hitherto regular, became now suspended, and her religious fears soon underwent a change. She fancied that God had, as a punishment, allowed that she should become pregnant! and accordingly she fancied she was so. So strong was this idea, that though her reasoning was on other subjects just, no argument, although used by religious persons, in whom she had the most perfect confidence, could remove the impression.

It was after this state had existed for some weeks that I first saw her. I could not ascertain by inquiry, or examination by pressure, that she felt any pain or other definite sensation of illness. She ate well; slept well; was able to attend to her ordinary employments, except in so far as her distress of mind interfered; her bowels acted regularly, and her pulse were rather slow: she fancied her legs were swollen and heavy, but the former her family denied. The only symptom she laid any stress on was the existence of *a sensation*; general in the system, particular in the abdomen, but undefined in its character; she could not liken it to any thing. She seemed generally languid, pale,

and exertionless. She had a particular disinclination to walking, and though she could exert herself in business, she gave over all her ordinary amusements. I cannot attempt any description of the mental distress she seemed to suffer; it may be conceived by recollecting her religious character, heightened by disease, and the fear of becoming an object of public scandal.

I could not ascertain what the previous diagnosis or treatment had been. At my first visit, I ordered a draught containing oleum ricini and oleum terebinthinæ, conceiving that some of the abdominal sensation might have arisen from flatulence. I also ordered frictions to the lower part of the spine with oleum crotonis, on account of the weight complained of in the inferior extremities. These means produced little appreciable relief, though there was some flatus expelled, and there was an eruption produced over the sacrum. In a few days I had an opportunity of speaking to her mother, and I ascertained, with some difficulty, that her usual period of menstruation had been about the 24th of each month. I was induced to inquire minutely on this subject, in consequence of M. Andral's observations, that in monomania the peculiar idea entertained, will generally guide us to the *seat* of the disorder.* M. Andral further observes, that in treating this form of mental alienation in females, we cannot expect much success while the menstruation continues disordered. In the present case, the idea of pregnancy plainly referred to the uterus; and the functions of that organ were deranged accordingly. The indication of course was to restore that organ to its normal condition. Remembering the directions given by Dr. Graves,† in one of an admirable series of papers, published in this Journal, for the re-establishment of this function at the period of monthly exacerbation—so to speak—seeing that this was the 19th, and that, properly, the menstruation should appear on the 24th, I ordered as follows:

* Andral's Lectures on Medical Pathology, see *Lancet*, vol. i., 1832, 1833.

† *Dublin Journal of Medical and Chemical Science*, &c., for May, 1833.

pill. aloes cum myrrha, gr. x. every night; two leeches to the inside of either thigh, close to the pudendum, on the alternate days; pediluvium, and frictions with a stimulating liniment on the feet, legs, and abdomen, every night. Under this treatment she menstruated freely for three days, commencing on the 23rd. There was no immediate relief from the monomania. After a few days I ordered as follows: to discontinue all but the frictions to the abdomen, which were persevered with as she still experienced *sensations* in that part;

R. Mist. Camphoræ, ℥iss.

Tinct. Cinchonæ Comp.

Tinct. Valerianæ Comp. ā ā ʒi.

Tinct. Aloes Comp. gutts. x. m. Ft. Haustus.

This draught three times, and a couple of pills of carbonate of iron and assafoetida, once each day; frictions with tartar emetic ointment to the spine.

Eleven days after the menstruation ceased, her family reported her to have appeared for some days very free from her mental distress. She now *chiefly* complained of physical sensations: she began to feel pain as well as heaviness in the legs. Her appetite, though before tolerably good, was reported better. I now sent her from home for change of scene, with directions to take her medicines with her. On the 16th of the following month she again menstruated, being eight or nine days earlier than the date of the re-establishment of that function in the previous month. Three weeks after this second menstruation, being still from home, and having since her departure regularly continued her medicines, she was reported to me as perfectly free from any mental uneasiness whatever, and by her own written account, "able to walk six miles farther than ever she could before." When I saw her soon after, the improvement which had taken place was great indeed. She was now quite cheerful and lively; free from all her fears, and her only complaint was a very slight pain in the situation of the su-

perior lumbar vertebra. Since the above, (now several months), my patient has continued perfectly free from her complaint.

In the above case, I was guided by M. Andral in the indications, and by Dr. Graves in the pursuit of those indications. Without the one I should perhaps not have known towards what organ to direct particular attention ; without the other, I might have pursued the indications ineffectually, by commencing with imperfect means, or at an improper period. Though a complaint of frequent occurrence, I cannot recollect that it is often mentioned in English medical literature it has never been my fortune to have heard it lectured upon, and I know that in practice it is sometimes confounded with other mental disorders, to which the simple term *mania* is proper. All facts on such a subject must be valuable, and particularly such as go to prove the truth of the opinion, that the nature of the diseased perception points out the seat of the diseased action, thus indicating a distinct, and often an easy method of cure. If a case of monomania presented itself, in which the false perception referred to the stomach or bowels, as of a snake or wolf, &c., in the abdomen, the above fact being proved, the indications would be greatly simplified. Believing as I do in the value of M. Andral's rule, had my case presented itself in the first instance, when only the great fear of damnation existed, and if, besides, there had been no suppression of the menstrual discharge, it would, perhaps, have depended on the degree of credence which I yielded to the doctrines of phrenology, whether or not I should have directed my treatment to the seat of *veneration* ! ‘*Rideat qui sapit* :’ but strange things have appeared in latter times, as the consent of the functions of the cerebellum and uterus for example, and the relief obtained in diseases of the one from treatment directed to the other.

How far the heaviness and subsequent pain in the lower extremities were dependent on an affection of the spine, I cannot determine ; but those symptoms departed with the mo-

nomania, while some spinal uneasiness remained. Neither shall I venture to say what particular share each of the means employed may have had in the ultimate recovery of the case : most of them, however, tended to the same end, the re-establishment of menstruation. Why the disease did not *immediately* disappear, on the restoration of this function, I cannot tell. Perhaps uterine congestion may explain all or many of those phenomena.

Before I conclude, I shall beg to call attention to a case, similar in many respects to the foregoing. I find in a recent number of an excellent periodical,* a case, condensed from the report of Mr. Lambert, in the *Lancet*, entitled "Anomalous Mental Affection." In this case, a girl of fifteen years of age imagined she had been ill-treated ; she had pains in the head, alternate excessive elevation and depression of spirits, used extravagant language and gesticulations : after a blister she had loss of feeling, and impairment of several senses, &c. The editor of the *Medico-Chirurgical Review*, calls it hysteria, and in all probability he is right, for in such instances monomania is perhaps no more than a species, or an occasional phenomenon of hysteria. It is perhaps thus also with the anæsthesia, or diminution of sense and sensation. M. Andral mentions this symptom as sometimes occurring in hysteria, and also after blisters, &c. Whether the case he called hysteria, or by whatever other name, it appears to me certain, that the editor of the *Medico-Chirurgical Review* has pointed out the treatment most likely to be effectual, viz. leeching about the pelvis, and other means for establishing menstruation.

* Johnson's *Medico-Chirurgical Review*, No. 41, July, 1834, p. 147. A work, which for various, valuable, and skilfully condensed medical information, cannot be surpassed.

ART. IV.—*Account of a Hæmorrhagic Diathesis existing in a Family, also of a peculiar Appearance of the Iris belonging to a Family.* By JONATHAN OSBORNE, President of the College of Physicians, &c.

JOHN GAMBLE, aged 13, was admitted into Sir Patrick Dun's Hospital, with inflammation of the capsule of the left shoulder joint. Two leeches were ordered to be applied. The application took place on the same evening, and considerable difficulty was experienced in stopping the bleeding. On the following morning it appeared that the bleeding had recommenced during the night, and was still going on. Recourse was had to the nitrate of silver, but although this was frequently applied, and all the other usual means for suppressing hæmorrhage were successively adopted, yet the blood repeatedly broke out during the three following days. I was now first made acquainted with the facts which I am about to relate. This lad had been lately affected with epistaxis to an alarming degree, and had lost two brothers in the following manner.

The eldest, when about nine years of age, laboured under some affection of the knee-joint, for which he was cupped at one of the surgical hospitals of this city. After some blood had been obtained, the knee was bound up and he returned home. He was not long at home when the bleeding recommenced, and the hæmorrhage at length became so formidable, that a messenger was sent to the hospital to request immediate assistance; an answer was returned that it might be allowed to continue, as the only danger was that it would not bleed sufficiently. It thus continued till a rapid sinking excited an increased alarm. Assistance was now procured, but all efforts proved unavailing, and he died on the following day.

A younger brother of my patient, aged about six years, while running, fell down and struck one of his temples against the corner of a table; a hæmorrhage ensued, which, notwith-

standing the efforts of the most distinguished members of the faculty in Drogheda, where the accident occurred, could not be appeased, and he rapidly sank and died on the next day.

My patient was of fair and ruddy complexion: the blood effused from the leech bites was observed not to coagulate; but whether the hæmorrhagic diathesis was attributable to this circumstance, or to the capillaries and small veins opened by the leech bites continuing open like arteries, and their coats not relaxing into contact with each other, as is usually the case in veins, we have not had any opportunity of determining.

A sister of those children is married, and has had a child without experiencing any dangerous hæmorrhage.

Much light may be thrown on the difficult subject of hereditary diseases, by accurate investigations into hereditary diatheses, idiosyncracies, or even hereditary likeness. Such are connected with peculiar temperaments, and these latter with peculiar diseases. As a physiological question; the descent of peculiar features in families, has never been examined so as to afford the pathologist proper data for ascertaining the laws of hereditary diseases, and yet there are the most abundant materials for this purpose, in the observations familiar to persons engaged in breeding cattle; nor are facts relating to our species wanted, but these lie scattered, and are often difficult of access. I, therefore, have the less hesitation in subjoining to the above case of hereditary disposition to hæmorrhage, a singular case, illustrative of hereditary likeness which fell under my observation.

John Murphy, aged fifty-two, was a patient in Sir Patrick Dun's hospital, for chronic inflammation of the capsules of the right hip-joint. At my first interview with him, I was struck with the remarkable appearance of his eyes, which is partially represented by the figure subjoined.



The iris in both had a dusky light yellowish ground, and a number of round dark reddish brown spots were sprinkled on them in an irregular manner, but in greatest number towards the internal angle of each eye. The spots on the back of a tortoise shell cat afford the best resemblance. My curiosity was excited, and having learned from him that he never had any affection of the eyes, he informed me of the following particulars, which were confirmed by the testimony of another person, who came from the same part of the country. He had fifteen brothers and five sisters, (by the same father and mother), who all possessed the same peculiarity, which was derived from his mother, whose name was Murray. Her three sisters and one brother had the same, which was derived from her mother, whose maiden name was F——, (I do not publish the name in full, lest possibly it might be disagreeable to the feelings of some individual). It is to this latter family that the peculiarity belongs, insomuch, that in the part of the country where they resided, (county Wexford), they have been commonly recognized by this distinction, and celebrated for communicating it to their posterity. He mentioned the name of a titled individual, not a resident of this city, and whom I have never seen, but who has obtained the same peculiarity, in consequence of an intermarriage between one of his ancestors, and a daughter of the F—s.

The above case is not to be explained on the principle of imitation, which has been resorted to as a means of accounting for similarity of countenance, of tone of voice, or of character. This is a structural peculiarity, and in a number of the Edinburgh Medical and Surgical Journal, I have mentioned a peculiarity of the stomach existing in a family, incapacitating them from vomiting, which, as will appear from a consideration of the circumstances attending it, must have been structural. Those structural differences handed down in families, and of which family likeness is only a part, may be conceived as furnishing the strongest predispositions for certain diseases, and thus here-

ditary diseases will appear to arise from hereditary similarity of structure, rather than from the *semina morbi* lying in a latent form in the patient's frame, as is commonly supposed.

The subject is one of great interest, and in order to be properly investigated, requires a great number of observations. The above are offered merely to induce others, who may be in possession of similar facts, to record them, and thus to aid in furnishing the materials for enabling us to arrive at a definite conclusion on the subject.

ART. V.—*Practical Observations on Fever, particularly with reference to the Plan of Treatment which has been generally pursued in the Belfast Fever Hospital for several years.*
By ROBERT LITTLE, M. D., Physician to that Institution, Physician Accoucheur to the Belfast Lying-in Charity, Physician to the Ulster Female Penitentiary, Lecturer on Midwifery, and the Diseases of Women and Children, &c.

FROM the very frequent occurrence of contagious fever in this country, and from the great annual mortality which it produces, especially amongst the lower classes of the people, I consider it entitled to more attention on the part of the student of medicine and that of the practical physician, than almost any other disease with which I am acquainted. Most other epidemic and contagious diseases occur only at intervals of one, two or more years, and then only prevail for a short time and afterwards disappear. This, however, is not by any means the case with the disease in question, for it is to be met with, particularly in large towns, at every season of the year, and although it has its periods of increase and decline, yet it cannot be said to be extinct at any one time. One would naturally suppose, from the great prevalence of this disease, that its nature would be much better understood by physicians than almost any other. This, however, is not the case, and I am certain, there is scarcely

another disease, about the nature and treatment of which physicians are more completely divided, than about that in question; and as the remedies which are employed for its cure, must be calculated to produce certain physical changes, either on the solids or fluids of which the body is composed, it is of course a matter of the first importance, to ascertain what the nature of such changes should be, for if the theories held relative to the nature of a disease be incorrect, it will not be possible to apply those remedies for its cure which will prove most beneficial. As almost every disease of an infectious nature, seems to run, if not interrupted during its progress, an almost uniform course, and as no disease of that description could manifest more uniform symptoms, than the one I am now considering, I think there can be no doubt, that some of those theorists, who are at variance respecting its nature, must be in error. If it be a disease of debility, as some will have it to be from the very commencement, antiphlogistic remedies would be injurious in its treatment; and if on the other hand, it be in every instance an inflammatory disease, tonic medicines would not fail to prove dangerous. It should on these accounts be the anxious wish of every physician to ascertain, if possible, the real nature of fever, before he attempts to take charge of its treatment.

The doctrine taught by some of the French and British physicians for many years past, respecting the inflammatory nature of fever, has given rise to a plan of treatment almost completely antiphlogistic. How far this plan has been successful, I will not now consider, as I will have occasion to examine it at considerable length in a subsequent part of this paper. There can be no doubt, that the character of different epidemics is in many instances different, so that those remedies which would be most suitable in one instance, would be improper in another. It should be observed, however, that the great cause of fever not being possessed of the same characters at all times, is the acci-

dental complications which sometimes occur from certain internal or external causes, in addition to those which are peculiar to its production. It will be found, for instance, that at some particular seasons of the year, the mucous lining of the air tubes of the lungs will be the part most particularly affected ; and, again, it will be found, that the mucous lining of the stomach and bowels suffers most. From these circumstances it is evident, that those diseased actions which appear to be most prominent at some particular seasons of the year, will not be so at others. It certainly would be quite improper to come to any general conclusion relative to the nature of fever, without a long and careful consideration of all those circumstances, whether external or internal, by which its character or progress can be influenced ; so that the average of a great number of cases should be strictly examined, before any one organ or part of the body is considered to be more affected than another. I state it as the result of the most careful *post mortem* examinations, in most of those cases of fever which have proved fatal under my care, in the Belfast hospital for the last four years, that the disease I am considering is not essentially inflammatory in its nature, and that those diseased actions which constitute the contagious fever of this country, are not produced by some local inflammatory action in certain of the most important internal organs of the body. I am quite sensible that some localities predispose, more than others, to inflammation of the mucous lining of the stomach and bowels, as well as other internal parts ; but making every possible allowance of this kind, I am quite satisfied that physicians have overrated the number of inflammatory complications, and this is more particularly the case with reference to the mucous lining of the stomach and bowels. Out of sixty fatal cases of fever in the Belfast hospital, which I examined with the greatest care, I did not find one of acute inflammation of the mucous lining of the stomach and bowels, and out of the same number of patients, I only found two cases of inflammation of the brain. The mucous lining of

the lungs, however, was considerably inflamed in four out of the sixty cases, but I did not find in one of the sixty inflammation of the substance of the lungs nor of the liver. The last mentioned organ was, however, in many instances much gorged with blood of a dark colour. It would therefore appear, that so far from inflammation of any internal organ of the body, being necessary to the existence of contagious fever, it is an occurrence which I have seldom met with in the Belfast hospital.

It is in my opinion quite idle to talk of one part of the body being more affected in fever than another, whether fluids or solids, and whoever has watched with attention its progress, must have observed, that from the very commencement of the attack, every individual part manifests diseased actions; and if these be more prominent in one organ than another, they are to be attributed to something peculiar in its powers, or to some internal or external cause, favouring more excitement of one part than another from the operation of contagion. The very first symptoms of the disease in question are marked by a deranged state of the brain and nervous system; the organs of secretion and absorption; muscular motion; animal heat, and in fact, every function and action of the body. It might just as well be said, that the pain which is generally experienced in the entire course of the spine, indicates inflammation of the spinal marrow, as that pain of the head indicates at the beginning, or during the progress of fever, inflammation of the brain. In some, I might say in many, of those cases of fever I have examined after death, where all those symptoms were present from the commencement, which are generally said to indicate inflammation of the brain, I have found that organ in the most healthy state, and the very same was the case with the stomach and bowels, and various other internal parts. I cannot, therefore, think, that local inflammation is necessary to the existence of contagious fever, but on the contrary, I am of opinion, that it is of very rare occurrence in that disease, and in very few in-

stances to be met with, no matter what internal part of the body be examined. From the great debility of the vascular system, but more particularly in the low types of fever, it very frequently happens, that some particular organ or part of the body receives more than its usual share of blood, and hence, from mere debility, there will be frequently found in fatal cases of fever, great vascularity of particular organs. When the part is examined, however, into which the excessive accumulation of blood has taken place, it will be found, that no organic changes, such as are produced by inflammation, have occurred, and this could not possibly be the case, provided it had continued for any considerable length of time, and had been possessed of the usual inflammatory characters. Venous and also arterial congestions are, therefore, frequently to be met with in fatal cases of fever, when nothing similar to the inflammatory process had taken place at any time during its course; and these congestions are merely the result of debility general and local. I know no part of the body so liable to these passive congestions, as the mucous lining of the air tubes of the lungs; and although the brain and some other internal parts suffer occasionally in the same way, yet it is more particularly in the lungs that congestion produces most frequently injurious effects on the progress and termination of the disease. I have found in the Belfast hospital, for the last four years, a very large proportion of the patients suffer from catarrhal affections during the winter season, and these I have always observed to produce a very injurious effect on the progress of the fever, from the copious mucous secretion with which they were generally accompanied. Notwithstanding that these congestions proceed in most cases from general and local debility, and not from active inflammatory action, they are not the less worthy the attention of the physician, as they often give rise to effusion, or an increase of the usual secretions of the part, and, consequently, to great functional derangement. In a subsequent part of this paper, I will have occasion to point out the effects of the loss of blood

on the progress of fever, and on that account I think it necessary to state what I have observed, with regard to what occurs respecting the state of particular parts of the vascular system, for the opinion that has been entertained, that vascular congestions in fever are mostly of an inflammatory nature, has given rise to a mode of practice, any thing but safe to the patient.

The changes which have been observed to take place in the qualities of the blood during the progress of fever, have given rise to the idea with some physicians of eminence, that the blood is primarily affected, and the diseased actions of the solids are merely symptomatic. In the course of contagious fever, the blood undoubtedly does exhibit various morbid appearances, but it certainly does not follow from this, that it is necessarily the part of the body in which the matter of contagion first produces its destructive influence ; for if the digestive organs by means of which it is formed, the arteries and veins by means of which it is circulated through the body, and the lungs by means of which it is purified, be all in a diseased state from the commencement, it would not be possible for the blood to retain those qualities it possesses in health. I think it is, therefore, just to consider the blood in contagious fever to be only changed in common with the various solids of the body.

From these premises it must appear, that I consider local inflammation not by any means necessary to the existence of contagious fever, nor even a frequent complication; and also, that the diseased appearances which the blood very generally assumes, is closely connected with the deranged state of the solids, and the general functional disorder of the solids with the changes which have taken place in the fluids. It is a matter of the greatest importance, in the treatment of fever, to settle the question whether it be a general disease or not, and also whether it be always inflammatory or not. It is besides of very great consequence to know how far the operation of contagious typhus is confined to the blood. It is certainly, however, very difficult to settle these points, on account of the

great variety of parts which enter into the composition of the human body, all mutually depending on each other for the regularity of their actions.

There is one thing that I would wish particularly to observe, respecting the changes produced on the solids and fluids of the body in fever ; it is, that the former never fail from the very commencement until the termination, or until the febrile action ceases, and the healthy action is established, to manifest the greatest diminution of strength, and the latter always exhibit a considerable change in their qualities. It is, therefore, with debility of the solids and an accompanying diseased state of the blood, that the physician has to contend from the commencement until the termination of this disease, and he cannot possibly apply a remedy useful for the one, that will not prove useful for the other. I have thus thought it necessary to give an outline of the views I hold relative to the nature of contagious fever, before I proceed to state what practice appears to me to be most beneficial, when it either exists in a complicated or uncomplicated form, or when it is accompanied with a great or slight diminution of all the powers of life.

Whether fever be a contagious disease or not, there is considerable diversity of opinion amongst medical men: some argue that it is always, or almost always, conveyed from one individual to another by close communication, and others, that it never spreads in this way, but proceeds from atmospheric causes, or in other words, from malaria, either general or local. From what I have observed respecting the spreading of fever, I would certainly maintain, that it is a disease very infectious in its nature, but more especially when the system is in a weak state at the time of exposure. I am quite convinced that fever does not always depend on exposure to contagion in its production, but sometimes proceeds from exposure to cold and moisture ; great bodily fatigue ; anxiety of mind, and other causes reducing suddenly the tone of the system ; so that the causes of this disease, which are very generally believed to be only

predisposing are occasionally exciting; an attack of fever from any of the debilitating causes I have mentioned may be precisely the same as that produced by exposure to the exhalations arising from the body of a person labouring under that disease; and this fever, not proceeding from the influence of contagion, may be communicated to attendants or persons coming into the sick chamber, in the usual way. I have known more than one or two instances, where great fatigue of body and mind brought on typhus fever, without any possibility of exposure to contagion, and the disease was communicated, notwithstanding this origin, in the usual way to other members of the family where the patient was confined, even when the place of attack and confinement were remote from each other.

Of all the patients admitted, labouring under fever, into the Belfast Fever Hospital for the last four years, there were only a very few, comparatively, who had not been exposed to contagion shortly before the attack, and there were very few indeed, who had not suffered before exposure from some or all of those causes which are considered the most predisposing. There is a very striking difference between the prevalence of fever amongst the rich and poor, and in the same class of patients, there is a wonderful difference between the temperate and intemperate. General debilitating causes of body and mind seem to be not only favourable to the operation of contagion, but even capable of producing the disease itself. To show how much poor living, accompanied with great bodily fatigue, favours the spreading of fever, I may instance what occurred in the Belfast hospital amongst the nurses, when their allowance of food and drink was not by any means so generous, as it has been for some years past. There was never a year that several of the nurses had not one or more attacks of fever, while their fatigue was great and their living was poor; but since the food and drink became more generous, it is a very rare thing indeed for any of them to become affected. Besides these changes tending to prevent the occurrence of fever

amongst the nurses, there were others which I consider of the greatest consequence in fever hospitals, as well as private families. I allude to a regulation, which requires the nurses to remove all the evacuations of the patients immediately, and expose the vessels in which they were contained, after being well washed, to the air for some time before they are again brought into the wards. In addition to this mode of preventing any disagreeable smell, and at the same time keeping down as far as possible contagious exhalations, the wards are well washed daily with warm water, and at all seasons of the year, when the temperature of the air is not too low, they are well ventilated. When the weather is very cold, the circulation of fresh air cannot be kept up so freely, as when the air is pretty warm, as is the case during all the summer months; and hence, the great difficulty, and sometimes even danger, of keeping up such a renewal of air in fever wards, during the winter season, as will be compatible with the safety of the patients, and at the same time prevent those contagious exhalations which are constantly rising from their bodies, from accumulating to such an extent as to become injurious to themselves or their attendants. By preventing contagious matter from accumulating in the air of a fever ward, the patient is guarded against danger, as well as his attendants, for that influence which is capable of producing in a healthy person, those diseased actions which constitute fever, must have a most dangerous effect, when continued after the morbid actions have taken place. It is, therefore, in the Belfast hospital, both for the safety of the fever patients and their attendants, an established rule to renew the air of the wards as frequently as possible.

It must appear from what has been said respecting contagion, that a generous diet and whatever else is necessary to keep up the tone of the system, is the best plan of preventing its operation on the body; and that to prevent any accumulation of those exhalations, which must surround, to a greater or less



extent, every person labouring under fever, has the most salutary effect both on the patient and attendant.

It is very difficult to determine what time must elapse after the commencement or decline of fever, before contagion commences or ceases to be generated. This point could not be possibly settled in a satisfactory way, while nothing is known positively as to the length of time that must elapse after exposure to contagion, before the febrile symptoms begin to manifest themselves. I have known persons, in many instances, contract fever by being exposed three weeks or a month after a patient's convalescence. This I have particularly noticed to occur in some instances, where patients were discharged from the hospital, and at once brought into close communication with their friends. It is no uncommon thing for every member of a family to suffer in succession, in consequence of being exposed to contagion in this way. I have very seldom, however, known the disease communicated to attendants or friends during the first three or four days after the commencement of the attack.

Amongst the poor, where every thing tends to favour the spreading of fever, the only chance of safety consists in their early removal from their ill-ventilated, damp, and dirty habitations, into the wards of a dry, well ventilated, clean hospital, where they can get suitable food, drink, and every other requisite necessary for their condition. I have had, during the last four years, frequently occasion to regret, that the fever patients were not sent into the Belfast hospital at an early stage of their disease. I have not only found delay in sending patients into hospital in fever, give rise to its spreading amongst the other inmates of the family, but to little chance of recovery when they were admitted; a great many patients are admitted into the wards of this institution, when what might be called the curable stage of the disease is past. When a patient labouring under fever is in a very weak state, I have always seen the worst effects produced by his removal. It is, therefore, in my opi-

nion, worse than useless, as far as recovery is concerned, to remove fever patients unless at an early stage, and the only possible excuse that can be offered for their removal at an advanced stage, is the prevention of the spreading of the disease. The fatal delay which I have frequently witnessed amongst these patients admitted into the Belfast hospital, was no doubt in very many instances owing to their friends or relations not making early application for medical advice, or to an unwillingness to be moved; but in by far the great majority of cases the delay arose from their not being able to get medical advice, notwithstanding it was earnestly sought for in proper time. In Belfast, the poor are attended at their own habitations gratuitously, by a number of medical men appointed for that purpose. This gratuitous attendance, in my opinion, is neither useful to the poor, nor profitable to the public; and I am quite satisfied, that it has been productive altogether of many disadvantages, and one of the most important of these is, the delay to which I have alluded. I think a pauper should just be attended with as much regularity, as a patient in the most comfortable circumstances, but such will never be the case, as long as medical men find money necessary to procure the means of subsistence; for no matter how humane they may be, the patients who are able to pay the fee must receive the first attention, and in all probability the patient who is able to pay nothing, will be neglected altogether, or what amounts to the same thing, he will not get advice until it is quite too late. If the diseases of the poor were less dangerous than the diseases of the rich, the plan of attendance that is very generally pursued in Belfast, might answer the purpose well enough, but if, on the contrary, they are more rapid in their progress, and fatal in their termination, they should receive more attention instead of less. I think, therefore, that medical men in large towns, and in none more than Belfast, are very blameable for undertaking gratuitous duties for the poor, which they cannot possibly perform in an efficient manner. It is true, that some of those who undertake to

attend the sick poor in this way, have little or no private practice, or are merely boys from college; but the person without practical experience, is in all probability, on account of his want of a correct knowledge of the characters and best mode of treating the different diseases which will come under his care, far more dangerous with regard to the safety of his patients, than the persons of experience who neglect them altogether. I am convinced, therefore, that the poor should be attended, not by physicians and surgeons just fresh from college, nor by men actively engaged in private practice, but by persons of experience who are allowed a proper remuneration, and who will devote their entire time to them. I do not mean by these observations to throw any blame on those medical gentlemen who have attended, and who are attending the poor gratuitously in Belfast, for they have all, to my own certain knowledge, done a great deal, certainly far more than should reasonably be expected of them, but not by any means so much as the sick poor required. I hope, however, the gratuitous system, which is in this town most injurious to the interests of the poor, will soon be changed for one more serviceable, not only to the interests of medical men, but to the public at large.

I have been induced to make the foregoing observations relative to the gratuitous attendance on the sick poor of this place, because I consider it is a system that has rendered the results in the Belfast fever hospital, for many years, totally different from what they might otherwise have been; and also, because the public are generally at least quite ignorant of the value of an efficient attendance on the poor, unless medical men lay aside all those selfish views which they generally expect to result indirectly from gratuitous attendance on paupers, and impress the public with the absolute necessity of their paying for medical attendance, in the same way that they pay for other necessities to the destitute sick, when unable to procure them themselves.

The type of fever has varied considerably in the Belfast

Fever Hospital for the last four years at different seasons, indifferent states of the atmosphere, and also according to the state of the physical powers of the body at the time of the attack. The calculation I have made is, that taking an average of all the cases admitted for four years, the one-third might be included under the head of synochus, one-third under that of typhus mitior, and one-third under that of typhus gravior. I have always observed in the Belfast hospital, that during the prevalence of close damp weather the disease was more asthenic, and during the prevalence of dry clear weather more of a sthenic character. The varieties of fever which are described by nosologists, are, in my opinion, always owing to internal or external causes, totally different from that of the nature of the contagion. I have, for instance, repeatedly known fever attack in succession five or six members of the same family, and while the first was in all probability severe typhus, the next was the mildest synochus, so that no two successive cases exhibited the same characters. In delicate females, and in weakly males, or in persons of both sexes who are advanced beyond forty or fifty years of age, I have always observed a large proportion of the cases to assume the typhoid character, and in children, and persons from fifteen to forty or fifty years of age, provided the treatment has been suitable from the commencement, the character of the disease is not so liable to be of the low kind. This however is still more particularly the case with children under fifteen years of age. I think it thus necessary to give a kind of outline of the character of those cases of fever which have been admitted into the Belfast hospital during the last four years, before I begin to detail the treatment which has been generally pursued.

By those who believe contagious fever to be always an inflammatory affection, blood-letting is a favourite remedy, on account of its supposed powers in the removal of some local inflammatory congestion, on which they imagine the general diseased actions which characterize the complaint depend. From

what I have already stated, respecting what appears to me to occur in consequence of the body being exposed to contagion, or when any other exciting cause of fever occurs, it could not be supposed that I would advocate the depleting plan of treatment. So far from being found useful in the hospital in this town, blood-letting has been found a most dangerous remedy, on account of its debilitating effects, its conversion of fever of a synochoid into that of a typhoid character, and the want of any good effect it seemed to possess in almost all cases of stopping the progress of the disease. Almost all young physicians have made trial of this remedy, after commencing their labours in the Belfast hospital, but have been all completely disappointed in its effects, and of course soon gave it up as not of a useful, but on the contrary of a dangerous kind.

Fever is a disease, which being once formed, has a tendency to run a determinate course, and to leave the body, before it disappears, in a state of very great debility. It, therefore, requires, that no remedies should be employed at any time during its progress, which have a strong tendency to lower the powers of the system, and at the same time possess no specific properties over the febrile action. I have not seen a single case of genuine contagious fever, where the loss of blood appeared to diminish its duration, but on the contrary, I have seen many cases where depletion, to the amount of twelve or sixteen ounces, had the most decided injurious effects. As blood-letting is seldom employed in the Belfast Fever Hospital, it is more particularly amongst those patients who have been treated for some time in their own habitations before admission, that its injurious effects are fully manifested. Amongst some of the bad effects resulting from the loss of blood, I may mention delirium, muscular tremors, and restlessness. I have in several instances seen delirium succeed almost immediately to the loss of blood, and when this occurrence took place, I have very seldom known the patient to recover. Delirium may be connected with great vascular excitement of the brain, or a languid

state of the circulation. It will be generally found, however, that in contagious fever, the last mentioned state of the cerebral circulation is that which is in nine cases out of ten to be met with; it is, therefore, no wonder that delirium is frequently excited, and in many instances increased by the loss of blood. In the treatment of different types of fever, the loss of blood will no doubt vary in its effects: there is one thing, however, of which I am quite convinced, that nothing that tends to relax the system suddenly can be useful, and on which account the loss of blood should be guarded against, as it in most instances favours that debility that must necessarily ensue, when the disease has proceeded a certain length. There cannot be the least doubt, that in the course of contagious fever, the different important organs of the body in many instances receive an unequal supply of blood, but such irregular distributions of blood are not in most instances owing to local inflammation, but local debility. It cannot, therefore, be expected that they can be removed by the use of the lancet; and hence, in all such cases, no matter whether the local congestion be in the brain, lungs, or abdominal viscera, it must be aggravated by debilitating means. In cases of local determinations of blood in fever, when it is not of a very low type, the abstraction of a small quantity of that fluid may not be productive of any harm; I think, however, that such irregular distributions can, in the great majority of instances, be remedied by means of a safer kind than that of depletion, and it forms, therefore, no part of the general plan of treating fever in the Belfast hospital, nor has it been found so safe as other means of a less debilitating nature. Even the abstraction of blood by means of leeches is seldom employed in that institution, although less liable to produce sudden relaxation of the system, than when the same amount is taken away by means of the lancet.

When any of the more important internal parts of the body suffer from inflammatory action, during the progress of contagious fever, a thing, as I have already mentioned, of very rare

occurrence, the abstraction of blood, by means of the lancet, to such an extent as would be perfectly safe, and absolutely necessary, were the inflammatory action not complicated in this way, would, in cases where febrile and inflammatory action are blended together, be productive of the most dangerous effects. I have witnessed in acute bronchitis, occurring during the progress of contagious fever, as well as in inflammatory affections of other important parts, the very worst effects produced by blood-letting, when not more than twelve or fourteen ounces of that fluid were abstracted. It is, in fact, quite impossible to calculate what effects may be produced by even a moderate bleeding in fever, when it is most likely from the local and general symptoms to prove beneficial. When, for instance, the mucous lining of the air tubes of the lungs is inflamed, the detraction of a very few ounces of blood will, in many cases, render the mucous secretion so abundant, as to produce death suddenly by suffocation. The fact is, contagious fever is a disease that does not bear the loss of blood well, no matter whether it be complicated with local inflammation or not; and although, like many dangerous remedies, it may not give rise in some cases to any very injurious effects, still it will in many others prove a most dangerous, nay a fatal mode of treatment, no matter to what extent it is carried, or how apparently favourable the case may seem to the physician to be for its removal. Being therefore satisfied, that it is a remedy that will prove very seldom useful in fever, and that it may, on the contrary, be productive of the worst effects, no matter to what extent it be carried, I would certainly lay it down as a rule, that it should not be employed, except in a very few instances, where that disease is complicated with local inflammatory action, and then only with the greatest circumspection, and by means of leeches in most cases instead of the lancet.

Calomel, either alone or combined with opium, is a very common remedy in the treatment of fever, but more particularly amongst those medical practitioners, who consider it an inflammatory affection. It is, however, either alone or in com-

bination, a medicine which I almost never employ in the Belfast hospital at any stage, or in any type or complication, and the reason why it is not more frequently employed is, because, like blood-letting, it is found to be too debilitating, and not by any means conducive to the favourable or speedy termination of the disease. I think it is very doubtful if calomel be possessed of any power at all in arresting the progress of contagious fever, whether used in large or small doses, or at an early or advanced stage. There can be no question, however, about its debilitating effects on the system, if used to such an extent as to act freely on the bowels; and in such a disease as that in question, when from the very commencement every action and function of the body manifest a want of vital energy, no good can be expected to result from its use. It is supposed by some physicians, that almost no disease can be cured without the aid of mercury, and they must give it as a matter of course in fever, as they do in other complaints. This mode of prescribing may perpetuate error, but it cannot be favourable in the management of diseases, as no medicine should ever be given, unless its operation and that of the disease for which it is intended as a cure, be properly considered and duly compared. When the operation of calomel is therefore considered, it is only wonderful, that it should be given in such a disease as contagious fever, when it is known to produce the most depressing effects, and cannot be of any use in either diminishing its course or mitigating its violence.

If mercury be administered in contagious fever, with the view of overcoming inflammatory action, it must be quite useless in the great majority of cases, if I be right in the opinion I have already expressed, respecting its non-inflammatory nature. The use of calomel, or any other mercurial preparation, cannot be profitable in improving the secretions, which are generally much vitiated in fever, while the general disorder of the nervous and vascular systems continues. It is not, therefore, medicine which improves this or that secretion,

but such as improve those parts of the body by means of which they are formed, that can be at all profitable in this disease, and on that account the physician should not lay too much stress on the advantages of remedies, of no avail in the improvement of the system as a whole. Calomel, when given in such doses as to act on the bowels, has in fever the most debilitating effects on every part of the body, and as debility in this disease seems to be the chief cause of derangement in the secreting organs, it must be clear, that remedies of a weakening kind cannot produce, in the majority of instances, any good effects. I do not mean, however, by these observations to say, that the antiphlogistic effects of calomel purgatives are never useful in the treatment of contagious fever, but wish merely to forbid their use in all those cases where there is no acute inflammatory action present.

The liver is an organ over whose secretions mercury is said to possess the most powerful effects ; and hence, when any symptom manifests itself of biliary derangement, it is this medicine that is employed, although any mild laxative would answer the purpose intended better, and at the same time, without any risk of producing too much general debility of the system.

The cold effusion that was so much praised for a length of time, on account of its powers in arresting the progress of fever, when employed at an early stage, is I believe at the present time almost in complete disuse, even by those who were its greatest advocates. In the Belfast hospital, during the last four years, I may say, that it has not been employed at all, for although I consider it to be possessed of considerable powers in some instances, when used at a proper time, and with the necessary precautions, yet I am persuaded that it is not at all suited to hospital practice. I have tried this remedy in private practice repeatedly, and under the most favourable circumstances, and I cannot say that it was by any means so successful, as others of a safer kind, and at the same time of easier application. During the winter season, I think the cold effusion

should never be employed, nor even during the spring and summer, when easterly winds prevail, lest inflammation should be excited in some important internal organ.

Having stated some of the remedies not in use, or at least very seldom used, in the Belfast Fever Hospital, I will now proceed to give an outline of the usual mode of treating fever in that institution, and it will be seen from the annexed table, that it is one attended with considerable success, notwithstanding the very advanced stage of the disease in which patients are usually admitted.

During the first three or four days of fever, there is very little increase of the heat of the surface of the body, and instead of the patient feeling too warm, he feels quite chilly. It is during this stage, that the progress of the disease can be easiest checked; but unfortunately in the Belfast hospital it is very seldom that a patient is admitted into the fever wards, until the disease has advanced to the eighth or tenth day. The treatment which I would particularly recommend, and which I have found most useful, consists, in the early stage of fever, in the use of diaphoretics and cooling laxatives. Sweating medicines, when employed in the usual way, are of very little avail, at the beginning of fever, in establishing the healthy actions of the body, just because the usual method consists in exciting sweating only for an hour or two hours at a time, and afterwards allowing it to completely subside, whereas, when once excited, it should be kept up for at least fifteen or sixteen hours, and should at no time be profuse. After the warm bath, or after being well sponged with warm water, I next usually prescribe a combination of cream of tartar, calcined magnesia, and compound powder of hippo, in small and frequently repeated doses, with a large quantity of warm whey, or some other mild warm fluid. Each of these powders generally contains, when intended for an adult, half a drachm of cream of tartar, fifteen grains of calcined magnesia, and eight grains of the compound powder of hippo. By being repeated every hour, with at least half a pint

of the warm fluid, the skin, at the end of two or three hours, will in most cases become quite moist, and can be kept so afterwards, by giving the powders at much longer intervals, provided a sufficient quantity of warm drink be taken between each dose. The sweating should never be profuse, and on that account, when it is easily excited, it will be found in many instances much better not to use any diaphoretic after the skin becomes moist, except some warm fluid, which should be taken freely. If the skin, during the first two or three days of an attack of fever, be kept moist, and if the bowels be kept at the same time free, it will be found, in two cases out of three, that the disease will be checked before it has been fully formed, or else, it will be diminished in duration after it has been completely formed, or rendered much milder. While efforts are made by the physician to check the progress or diminish the severity of fever, it is absolutely necessary for the patient to be kept in a state of absolute rest, for this being neglected, all his efforts will be quite unavailing. No strong purgative should ever be ordered to a patient labouring under this disease, and this is a thing that has been as strictly observed by me in the Belfast Fever Hospital at the beginning, as at any other time of the disease. I may say, that with the exception of castor-oil, calcined magnesia, either alone or in combination with cream of tartar, or epsom salts, no other purgative medicine has been given by my directions to any fever patient in the Belfast hospital for the last four years. Strong purgative medicines, administered at the beginning of fever, never fail to prove injurious, either in rendering its type lower, or preventing it from being suddenly checked: and at a more advanced stage, they, like blood-letting, debilitate the system quite too much. In every stage of this disease, it is absolutely necessary to prevent the bowels from becoming too much loaded with feculent matter; but this is all that is required at any time, for nothing has a greater tendency to lower the tone of the system than drastic purgatives. When the more fluid part of the blood is carried

off by mild diaphoretics, there is almost no exhaustion produced, if a patient drinks during their operation plenty of fluid; so that the moderate sweating I recommend at the commencement of fever, has not a debilitating effect, unless it be forced by medicines of a stimulating kind, and little drink be taken during their operation; but no matter what precaution be taken, drastic purgatives will be found very debilitating. When the second or hot stage of fever has been once established, it is then no easy matter to diminish its duration by any remedies that can be employed. In this stage, one of the most important things that the medical practitioner can do, is to reduce the heat of the surface, and establish its natural secretions. Some attempt to accomplish these very important objects, by the internal use of cooling diaphoretics, and others place the greatest reliance on the application of cold water, or vinegar and water, to the surface, by means of a sponge. In the Belfast hospital I have been long in the habit of using the vinegar and water tepid instead of cold, and I am quite satisfied, that it has a more powerfully cooling effect, and at the same time is more applicable to the different seasons of the year, the different stages of the disease, powers of the system, and inflammatory complications. The sponging with tepid vinegar and water should be repeated every twenty minutes or half hour, and should be continued, observing these intervals, until the heat of the skin is brought to the healthy standard, and until its secretions are completely established. Besides the valuable properties of tepid vinegar and water in exciting the cutaneous secretion, it has the very best effects in promoting other secretions. It frequently, for instance, renders the tongue moist, and increases the urinary discharge. By bringing down the heat of the surface, and by diluting the blood, the tepid application I am now considering, appears to me to be far superior to any other remedy that can be employed. In addition to the valuable properties I have just mentioned, the tepid application to the skin will be found to have a most powerful effect in lessen-

ing or preventing delirium, and procuring sleep. The last mentioned effects, when it has been freely applied for a short time, will in many cases prove most decided. The fact is, that when the surface is kept moist with tepid vinegar and water, there will very seldom be occasion to make use of internal sedatives or narcotics, and this is a thing in my opinion of the greatest consequence, because opium, which is the narcotic mostly employed, tends not only to increase delirium, but also to diminish all the secretions, and thus keep up the disease.

In addition to the application I have been considering, the internal use of spirit of nitre, combined with hippo wine and extract of hyosciamus, has certainly a good effect during the second stage of fever ; but tartar emetic or any other medicine of a debilitating kind would, in all cases, be productive of very considerable injury, and should, therefore, not be employed. Diluting drinks are no less useful during the second than they are during the first stage of fever, and I think they should be employed, no matter whether there be urgent thirst or not. The drink that is generally used in the Belfast hospital, particularly when the disease is of a very low type, is the infusion of roses, which is sometimes taken to the extent of three pints or two quarts daily. It is very frequently the case that patients labouring under fever, whose mouths and fauces are perfectly parched, do not ask for drink, in consequence of their being unable from delirium to attend to their sensations. Drink should, therefore, be presented to a patient labouring under this disease, whether he ask for it or not, at very short intervals, say every half hour, and in all cases when the mouth is dry, he should be urged to take as large draughts at a time as possible.

Wine and other cordial and stimulating remedies are used at a very early stage of fever in the Belfast hospital, and it is to that practice that the very great success in that institution is mainly to be attributed. As soon as the pulse indicates any general weakness of the system, the use of wine is imme-

diately commenced. In the first place, the quantity given daily does not exceed four or six ounces, but in proportion as the disease advances and as the debility increases, the quantity is increased until it sometimes amounts to sixteen or twenty ounces daily. In every case, the wine is mixed with three or four parts of water, and in some cases, instead of water, with the same proportion of the infusion of roses.

It is a very mistaken idea, and it is one that too often prevails, that the use of wine is improper, until, from the state of the pulse and other circumstances, great debility is indicated. If cordials, such as wine and spirit of nitre, be not given in this disease before great debility sets in, they will be found in very few instances of much use. Wine is certainly not required in all cases of contagious fever, but only in those where there is considerable general debility, and should this manifest itself at the third or fourth day of the disease, its use should be begun, and instead of increasing the heat of the surface, the dryness of the tongue and fauces, the delirium and other symptoms, it will have the very best effect in lessening them, when its use is combined with copious diluting drinks, and the reduction of the heat of the surface is attended to by means of the tepid ab-lution. When there is any local inflammatory action going on in conjunction with fever, the use of wine would in most instances be improper, notwithstanding the presence of much general debility, and it is only when these inflammatory complications exist, that wine is improper in fever, for as I have stated, when there is any considerable debility, no matter how far the disease has advanced, it should be given. One great advantage in the early use of wine, is its effects in bringing the fever soon to a termination by establishing the tone of the system. I know no better plan of preventing fever, than preserving the healthy tone of the body, and when it has taken place, I know no better mode of lessening its long continuance, than that of giving such remedies as will preserve, and at the same time

rouse the system. In addition to the good effects of wine already mentioned, it is most powerful in allaying delirium and procuring sleep, so that neither of the two last mentioned symptoms should contra-indicate its use, but on the contrary favour it. I have known a few ounces of wine quiet a patient in the most restless state of delirium ; and I have also known by its use sleep produced, when it had been completely absent for several days. The use of wine in low fever seems, therefore, not only to have a tonic but also a sedative effect. This is quite clear, not only from its promoting sleep and lessening delirium, but likewise from its allaying that general muscular inquietude of the body, which in this disease is so distressing, and which must add very much to the exhaustion, which is the invariable result of continued febrile action.

Aromatic spirit of ammonia, ether, camphor, whiskey, and other strong stimulants may be necessary in fever, when there is very great debility. I may observe here, however, that it is only when the disease is not properly treated from the commencement that their use is rendered necessary ; this is at least the case in nine patients out of ten. By allowing the strength to sink very low in fever, it will be found that strong stimulants may give a very temporary vigour, but it is very seldom that they are so far effectual, as to prevent a fatal termination, no matter to what extent they are given. The reason why stimulating remedies have been considered by some of little efficacy in the treatment of this disease, is owing to their use being delayed too long for any thing of the kind to prove of much avail. The fact is, that medicines of a stimulating or tonic nature cannot be of much use in that disease, unless the system be possessed of a certain degree of strength ; but the strength of the system is very frequently allowed to sink so low, before such remedies are administered, that no good effects can be expected. I am, therefore, decidedly of opinion, that wine, spirit of nitre, and other suitable tonics and cordials, cannot be commenced too soon in contagious fever, when it is likely to assume

a low type ; and so far from aggravating the febrile symptoms, they will be found most effectual in bringing the disease to a speedy and at the same time a favourable termination. It is absolutely necessary, however, to combine with the use of cordials, such as I have just mentioned, the repeated application of tepid vinegar and water to the surface ; the internal use of cooling and sedative diaphoretics and mild laxatives. I may mention here, that laxatives during the second stage of fever, as well as the first, should be composed of castor oil, or calcined magnesia, combined with cream of tartar, or epsom salt.

In low cases of contagious fever, it will sometimes be found, that sulphate of quina and aromatic sulphuric acid, will have the most happy effect in diminishing its duration. In the Belfast hospital, this combination is very much used, long before a crisis has taken place. It is very frequently the case, that no perceptible crisis ever takes place in fever, and instead of the symptoms suddenly giving way, they go on, though gradually diminishing in degree for many days. In such cases as these, the quina and acid, when carried sufficiently far, will be found very effectual in establishing the healthy actions of the body. Neither dryness of the skin, nor any other symptom indicating the continuance of febrile action, would forbid the use of these tonics. It is, therefore, quite wrong to think, that quina and other strengthening remedies should be deferred until no symptom is present but that of general debility, while their efficacy will be found of the greatest value, before any crisis has taken place.

In the convalescent stage of fever, the wine, quina, aromatic sulphuric acid, and other tonics are employed very freely in the Belfast hospital, and it is a very rare thing for a relapse to take place in that institution. When stimulating or tonic medicines are found necessary during any stage of this disease, the greatest care should be taken to allow the strength of the system to be sufficiently established before their use be discontinued. If this be not attended to, and if the patient either

from overloading his stomach, taking too much exercise, or from any other cause, should reduce suddenly the powers of the system, relapse will in many cases be the consequence. Among all the patients admitted annually into the Belfast Fever Hospital, I am quite satisfied there occur not more than one or two relapses.

While patients labouring under fever should get large quantities of mild diluting drinks at every stage during its continuance, I think they should also be allowed a considerable quantity of light nutritious food, from the very commencement of the febrile attack. It is true, that the functions of the stomach and bowels are very much impaired in this disease, and of course they cannot be expected to assimilate food as in health, and consequently, any thing difficult of digestion taken into the stomach, will not be changed in such a manner as to become fit for the support of the system. But if light food, such as very thin gruel, light panada, or arrow root boiled in water, and sweetened with sugar, be given in small quantities at short intervals, it will not oppress the stomach, while it will prevent much of that debility which is produced by the want of food, which patients labouring under fever generally experience. I do think that the extreme prostration of the system which takes place in the great majority of cases of contagious fever, would never arrive at such a height as is generally the case, were the use of light, nourishing food looked upon as a thing more likely to be useful, than all the medicine the physician can order. As long as fever continues, so long there will be no desire for food ; but that is no reason that food of a light, nutritious kind should not be given with the greatest regularity. While the acute symptoms of the disease continue, light food, such as I have mentioned, would be quite sufficient ; but as soon as convalescence has taken place, it should then be gradually made more generous. I am quite satisfied, that very many patients are allowed to sink in fever, not for want of wine nor any other cordial, but for want of nutritious food,

such as I have mentioned, and such as would be suitable to the powers of the stomach at the time. As the patient labouring under fever should be encouraged to take drink freely, no matter whether he experiences the sensation of thirst or not, in like manner he should get food sufficient to repair the waste of the body, whether he have a desire for it or not. Food must, therefore, be presented to a patient labouring under this disease, and he must be encouraged to take it in small quantities, at short intervals, whether he be delirious and unable to attend to his sensations, or, as is generally the case, from the beginning until the termination of a febrile attack, the appetite for food is nearly extinct. Wine is, in the treatment of the disease in question, a most valuable cordial, but it does not possess any considerable nutritious qualities, and it cannot be a substitute for light food.

In the contagious fever of this country, I have already mentioned, that acute inflammatory complications are not very common, but that what might be called passive congestions of blood in different important vital organs of the body, such as the brain, mucous lining of the trachea and bronchiæ, &c. are of frequent occurrence. In the Belfast hospital, instead of the lancet, the application of different counter-irritants is mostly trusted to for the relief of those important internal organs of the body, which sometimes suffer much from an excessive accumulation of blood. When symptoms indicative of a fulness of the blood vessels of the brain manifest themselves, a blister should either be immediately applied to the nape of the neck, or turpentine should be applied over the neck and back part of the head. I would in most cases prefer the blister when the head is the part affected. The lower the type of the fever is, the more the functions of the brain become diseased from mere debility of its vessels, and the greater the necessity is of avoiding any thing of a debilitating kind, such as blood-letting, and of having recourse merely to such remedies as will rouse the action of its vessels, and determine to the external parts. Besides the effect which counter-irritation produces in lessening

delirium, and procuring sleep, it has a very powerful stimulating effect on the entire system. Independently, therefore, of the valuable properties of blister and other counter-irritating applications to the upper part of the spine and back part of the head, the system receives by them in low cases of fever a most salutary influence, so they are not to be considered so much local as general remedies.

When the mucous lining of the trachea and bronchiæ, or any other part of the respiratory organs, becomes the seat of sanguineous congestion during the progress of fever, the application of turpentine as a counter-irritant is preferred to any other remedy of that description, on account of its anti-spasmodic, in addition to its stimulating effects. When the slightest symptom is present of any chest affection in connexion with contagious fever, I make it a rule in the hospital, to commence immediately the turpentine application, and keep up by it a degree of cutaneous irritation just proportioned to the necessity of the case. In some instances a few applications of the turpentine daily, will be sufficient; but again, the state of the internal parts may require the application to be made at very short intervals, so as to excite a very high degree of external irritation. I am convinced, that the early application of this embrocation to the chest, when the internal parts manifest symptoms of disease, has saved very many individuals that could not have been preserved by any other means; and hence, in this institution, it is a remedy that has been very extensively used under my direction. When affections of the mucous lining of the air tubes of the lungs occur in fever, they are generally productive of the most disastrous effects, if either treated by depletion, or allowed to proceed without the necessary applications. When blood-letting is practised, the local and general debility of the system which frequently ensue, give rise in very many instances to such an accumulation of mucus in the air tubes, as will produce, by the exclusion of atmospheric air from the air cells of the lungs, complete asphyxia. With regard to expectorants they are generally a very unprofitable class of remedies in pulmonary affec-

tions, under any circumstances, but when these are complicated with fever, they seem particularly to be of little avail.

It is very seldom that the mucous coat of the stomach and bowels is affected with inflammatory symptoms in the Belfast fever hospital, but when this is the case, the application of blisters or turpentine is mostly trusted to, and in almost all cases with complete success. The preference, however, is mostly given to the turpentine, so that when vomiting, diarrhœa, or any other symptom of intestinal irritation manifests itself, its use is commenced and continued at such intervals as to keep up a degree of cutaneous inflammation, sufficient for the relief of the internal parts. If the application of turpentine to the abdomen do not succeed in arresting the progress of diarrhœa, and other affections depending on sanguineous congestions of the digestive organs, it is because it is not applied efficiently at an early stage. When diarrhœa supervenes during the progress of contagious fever, it very soon terminates in ulceration of the bowels, if allowed to go on for a considerable length of time, and it is, therefore, only at an early stage that much can be expected from any remedy, whether internal or external. I have frequently tried the comparative advantages of external and internal remedies for the cure of looseness of the bowels, both in cases where it is complicated with contagious fever, and in cases where no complication of the kind exists, and I would certainly, if trusting to either, give the preference to the former, but more particularly when used at an early stage.

Stomachic and intestinal affections are certainly of far less frequent occurrence amongst the fever patients admitted into the Belfast hospital, than it would appear they are in some other establishments of the same kind, and this I am fully convinced, is not to be attributed to any thing peculiar in the place giving rise to such exemption, but to the general mode of treatment which is produced in that institution. When irritating purgative medicines are given from the commencement of contagious fever, there will be in hospital practice a great many cases of diarrhœa, and it is from the very great mildness of the

laxative medicines which are given, at all times, that this complication is so seldom to be met with in the institution to which I have been alluding.

The gastro-intestinal inflammation, which has of late years been considered by some physicians an invariable accompaniment of contagious fever, is in my opinion, in almost all cases, a mere creature of the imagination. The redness of the tongue, epigastric sensibility, and retching or vomiting, by which symptoms its presence is said to be indicated, are, in my opinion, in very few instances, owing to any local inflammatory action in the mucous lining of the stomach and bowels.

From the foregoing observations respecting the nature and treatment of contagious fever, it will be seen, that I do not consider it essentially, nor even frequently, an inflammatory disease, but, on the contrary, a disease of debility; and viewing it as such in most instances, I consider that strong antiphlogistic remedies are improper at any stage from its commencement until its termination. But notwithstanding that I consider contagious fever to be, during all its stages, a disease of debility, yet from what has been stated respecting its treatment in the course of this paper, it must be quite evident, that I do not recommend any thing stimulating either as food, or drink, or medicine, at any stage, unless the debility is so great, as to render the powers of the system unequal to establish its own healthy actions. The time at which dangerous debility may set in, so as to require the use of tonic and stimulating remedies, may be as early as the third, fourth, or fifth days, and hence no rule can be laid down with regard to the time such medicines should be commenced. I have stated, that so far from the use of wine increasing delirium, muscular tremors, heat of the surface, and other febrile symptoms, it will be found in the great majority of cases, where these symptoms are accompanied with much debility, to prove a most potent means of relieving them. The sweating that has been recommended in the first stage of the disease in question, is so slight, that it could not possibly produce much debility, but more particularly when it is in a great

measure excited and kept up by warm diluting drinks, so that although perspiration is recommended as one of the best means of putting an end to febrile action, when employed at an early stage, it is not a remedy that is calculated to produce debility, when only carried to the extent I have stated. The laxatives which are employed in the first and in all the subsequent stages of fever, are of the mildest description, and the tepid sponging, which is a remedy that is much trusted to during the entire progress of the disease, while the skin remains dry and unusually warm, cannot in any way lower the tone of the system. It would, therefore, appear that nothing should be used at any stage of fever that can debilitate, while all unnecessary stimulants are guarded against. This is the practice that has been pursued in the Belfast Fever Hospital for several years, and it is one, as will be seen by a reference to the annexed table, which has proved eminently successful.

BELFAST FEVER HOSPITAL.

	ADMITTED.			DIED.		
	Males.	Females.	Total.	Males.	Females.	Total.
Fever patients remaining } in Hospital, }	7	6	13			
do. admitted in 1831,	258	303	561	21	23	44
do. do. 1832,	490	545	1,035	43	36	79
do. do. 1833,	247	255	502	26	22	48
do. do. 1834,	229	247	476	19	24	43
Total cases treated,	1,231	1,356	2,587	109	105	214
Of these moribund on } admission, }						43
Total deaths,						171
Total recoveries,			2,416			
Shewing a mortality of one in $15\frac{22}{171}$ cases.						

ART. VI.—MR. ANDREW CARMICHAEL'S *Examination of Mr. Macnish's Objections to his Theory of Sleep*, in the Phrenological Journal for December, 1834.

MR. MACNISH has set me an admirable example in the good temper and kindly feeling with which he has combated my hypothesis of the proximate cause of sleep. I trust I shall be able to convince him, that my views are rational and well grounded, notwithstanding his objections; and I still more anxiously hope, that in executing my task, if I have not his abilities, I have at least a wish to imitate his courtesy, in our common pursuit, the ascertainment of a curious and interesting, even though it be an unimportant truth.

My proposition is, that “*the process of assimilation in the brain is the actual cause of sleep;*” but Mr. Macnish cannot conceive how a natural and healthy deposition of new particles, should occasion a cessation in the functions of any organ; that before such a deposition can take place, there must be an augmented circulation of blood in the part, and that the greater the quantity of blood sent to an organ, the greater is the energy of its manifestations. “During sleep,” he adds, “the blood is propelled in greater abundance into the liver and stomach than in the waking state, the consequence of which is, that these viscera act more vigorously, and that digestion is carried on with increased activity;” and he asks, “why should the brain be an exception to this general law?”* That the brain is an exception to this general law, is the opinion of Blumenbach and other physiologists, including Mr. Macnish himself.† Blumenbach even considers the *diminished or impeded flow of oxygenated blood to the brain*, as the proximate cause of sleep.‡ His able and learned translator observes, “analogy

* Phrenological Journal, No. xlii. p. 176.

† Id. 177.

‡ Elliotson's Translation of Blumenbach's Physiology, p. 282, London, 1828.

renders it extremely probable, that during the inactivity of sleep, the brain having less occasion for arterial blood, has a less vigorous circulation than during the waking state ; and we know, that whatever diminishes the ordinary determination of blood to the brain, or impairs the movement of the blood through it, disposes to sleep. But although this be granted, it must be viewed, *not as the cause*, but as a circumstance, or in fact, a consequence of ordinary sleep.”* Richerand expresses the same opinion. “During sleep the inward or *assimilating functions* are going on : digestion, absorption, *circulation*, respiration, *secretion*, *nutrition* are carried on ; some, as absorption and *nutrition*, with more energy than during waking, whilst *others* are evidently slackened. During sleep the *pulse* is slower and weaker ; inspiration is less frequent ; insensible perspiration, and all other humours derived from the blood, are separated in smaller quantity.”†—“While it lasts the cerebral mass collapses ; a sign that *the flow of blood into it is remarkably lessened*.”‡ My theory, therefore, did not (as he supposed) lead Mr. Macnish to conclude, “that the brain is least active, when the circulation is most urgently at work within its substance.” On the contrary it appears, that, in accordance with my theory, while the brain *is least active*, so is also the circulation within its substance. He calls upon me, however, to shew, “that assimilation may proceed with increased activity, without any additional impulse being given to the circulation,” and allows, that if I shall do so my doctrine may *then* acquire plausibility.§

This is easily done, for, as already noticed, Mr. Macnish himself admits, that “so far from there being any increase of blood in the brain during healthy sleep, it is proved, that the circulating fluid is actually *lessened*.”|| And he even goes so

* Elliotson's Translation of Blumenbach's Physiology, p. 285.

† Richerand's Physiology, p. 344, London 1815.

‡ Id. 347.

§ Phrenological Journal, No. xlii. pp. 176, 177.

|| Id. 131.

far as to state, that sleep is the period in which *the regeneration of the body* chiefly takes place.* And Darwin shows the mode by which it may be rationally supposed that this is accomplished. He argues, that all the filaments composing the solid parts of the body have possessed, or do possess, the power of contraction, and of consequent inertion or elongation; and that it seems probable, that the nutritive particles are applied during their times of elongation, when their original constituent particles are removed to a greater distance from each other. "For (he continues) each muscular or sensual fibre may be considered as a row or string of beads, which approach when in contraction, and recede *during its rest or elongation*; and our daily experience shows us, that *great action emaciates the system, and that it is repaired during rest.*"†

But still more closely to meet Mr. Macnish's challenge, is it necessary to remind him, that during the over-accelerated circulation of the blood which attends fever, the secretions of the several glands are more or less disturbed, and are sometimes even interrupted altogether; while the first effect of a return to a slow circulation, is the restoration of those organs to the due performance of their healthy functions? Then wakefulness, raving, and restlessness give way to a deep, profound, and lengthened sleep; the exhausted brain is renewed and invigorated; the crisis is past, and sanity of mind is rapidly succeeded by sanity of body.

Again, is it necessary to remind Mr. Macnish, that one of the earliest consequences of inflammation upon any secreting organ is a cessation of its functions; and that these functions cannot be restored until the inflammation is allayed, and the circulation reduced within its ordinary bounds? It follows, from all these facts, that increased activity in the circulation

* *Philosophy of Sleep*, 2nd ed. 21.

† *Zoonomia*, sec. 37, 8, vol. i. of the Dublin edition of 1800, p. 529.

may impede instead of impelling the process of assimilation. But to come still closer to the point at issue: I have already cited Richerand's observation, that *nutrition* is carried on during sleep, with more energy than during waking. He says elsewhere, that "*nutrition* is but a peculiar mode of secretion, which is different in every organ."* And he continues, "the nerves, of which there is always a certain number in the structure of the secretory organs, give to each of them a peculiar sensibility, by means of which they discover in the blood which the vessels bring to them, the materials of the fluid which they are destined to secrete; and these they appropriate to themselves by a real selection."† Permit me to add, that the complicated form of the glands, consisting as well of nerves as of a number of vessels of all kinds, whose convoluted arrangements and capillary calibre, must necessarily impede and lessen the rapidity of the fluids circulating in them, apparently indicate a slowness of motion, as *one of the conditions* by which the peculiar secretion is produced. The slowness of the circulation, therefore, in the brain, seems happily fitted for the production of the nervous substance—that fine and exquisite soil intended by the Author of Nature, for the nurture of the thoughts, the passions, and the powers of action. *Another condition* is, that there should be nerves to select from the circulating fluid the appropriate materials and the scattered ingredients of this soil. Whether the brain itself performs this office, or whether it contains a peculiar machinery for the purpose, is a question that must be left to future physiologists to decide; but if the accession of new particles be considerable, it is not very irrational to suppose, that the, as yet unassimilated, mass should act like an extraneous body on the delicate structure of the brain, and paralyze its powers of thinking, feeling, and willing, until perfectly assimilated with the original organ.

* Richerand, 230.

† Id. 231.

I have nothing to object to Mr. Macnish's observation, that I look upon sleep "as being occasioned purely by mechanical compression, or something closely resembling it." The whole of my hypothesis rests in the supposition, that the new mass of particles acts like an extraneous body on the cerebral substance, and occasions the paralysis of sleep,—a healthy and natural paralysis, very different from the paralysis of disease, occasioned by "the effusion of blood, or serum, or purulent matter," or "the beating in of a portion of the skull-cap" on the brain.*

But, asks Mr. Macnish, "supposing that healthy sleep is always occasioned by mechanical compression, how are we to account for people being so easily awakened? What, in such a case, becomes of this pressure? Is the load at once lifted off the person's brain? What becomes of the assimilative particles which are squeezing his senses out of him, and submerging him under the billows of sleep?"†

People are not *always* so easily awakened as Mr. Macnish here supposes. It is true, very trifling causes will awake a person who has taken nearly his full complement of sleep: or if he is not constitutionally what is called a heavy sleeper. But do we never hear of an individual that could not be roused from an intense sleep by any effort to awake him? and who has even been carried asleep from his chamber amidst the alarm of fire or of flood? Which of us, if suddenly disturbed in the middle of the night, has not started from bed half asleep and half awake? Which of us has not occasionally felt that species of head-ach which scarcely amounts to pain, and is little more than a lethargic and sluggish inertness, accompanied by mental confusion and ineptitude, occasioned apparently by the pressure of the new nervous particles not yet perfectly assimilated?‡ Does it not sometimes require considerable exertion, whether muscular or mental, to keep ourselves awake? But if we *gradually*

* Phrenological Journal, No. xlii. p. 177.

† Id. id.

‡ See Tilloch's Philosophical Magazine, No. liv. p. 326.

shake of the pressure, the load is not at once, but *gradually* lifted off the brain, "the assimilative particles which are squeezing our senses out of us," entering into perfect assimilation with the substance of the brain, and becoming adequate instruments of perception and reflection, feeling and will,—operations in which they never had assisted before. But in the natural course of things this perfect assimilation takes place before our awaking senses bring us into communication with the external world; and as organ after organ becomes fitted for exercise, the thoughts in which it is engaged are embodied in a dream. It is not necessary, therefore, to suppose, that "one part of the brain may be fattening while another is starving;" *the fattening* has already been accomplished, and *the starving* scarcely is an applicable epithet, as the fattening is *then* merely turned to the use for which it was intended by nature. Mr. Macnish, however, says, that it is just as rational to infer, that the assimilative operation is at work in one leg, and at a stand in the other.* But how will this illustration suit his own theory? The "*nervous energy*" has at least as general an influence as the process of assimilation; and he will find it as difficult to set *it* to work in one leg, and make it stand still in the other, as the task he is pleased to impose upon me. As far, therefore, as Mr. Macnish's legs can contribute to the support of his argument, either of us may be right, or both of us wrong.

I have nothing more to say as to the idiosyncracies of General Elliot and Dr. Reid, one of whom, it seems, acted on the principle of theameleon, and the other of the boa constrictor. There is no very wide difference of opinion between Mr. Macnish and me with respect to these gentlemen, their habits, and the result. Nor have I any farther objections now to adduce against "*the sensorial power.*" Mr. Macnish avers, that he can show, that one organ may have an excess and another a deficiency, with as much ease, as that one body may be positively, and another negatively electrified.† I wish he could shew, that

* Phrenological Journal, No. xlii. p. 178.

† Id. id.

these two powers were one and the same : this would be an undertaking worthy of his abilities.* He will have then exchanged a mere word, a mere general term, comprising a variety of meanings, for a real, definite, acknowledged, substantial existence. I shall willingly admit its operation in all the phenomena which can be legitimately assigned to it ; and if he can prove that it performs the office which I have ascribed to the process of assimilation, by such a concentration of facts as I have brought forward, I promise him faithfully to relinquish my hypothesis in favour of his new and improved one, even if there be in the balance but the weight of a feather against me.

I must, however, dissent from almost every word Mr. Macnish has said in contrasting active-minded, deep-thinking,

* Mr. Macnish will find this task already half accomplished to his hands by Doctor Wilson Philip. That able physiologist, in his valuable and very original *Inquiry into the Nature of Sleep and Death*, and other of his writings, to which this work refers, has proved that voltaic electricity is capable of exciting the muscles of involuntary, as well as those of *voluntary* motion ; and that it is not only capable of forming the secreted fluids from the blood, when applied in the same way and under the same circumstances as the *nervous influence*, but of maintaining all the other functions on which the healthy structure depends ; and in both instances, as perfectly as the nervous influence itself.—*Inquiry*, &c. p. 250.

It seems, however, that Doctor Prout, with more liberality than was necessary, gave Doctor Philip the merit of attempting the entire task—nay, much more than the entire—of maintaining, and endeavouring experimentally to prove, that electricity is an *intelligent* agency, acting with a certain object ; in one nerve digesting and assimilating food, in another conveying sight, in another conveying sound, and in the brain itself actually *thinking*.—*Id.* p. 238.

Doctor Philip, however, very properly disclaims the unmerited compliment, confining his pretensions to his interesting discoveries with respect to the *nervous influence*, which, throughout his work, he carefully distinguishes from the *sensorial influence*, to which last alone he ascribes the more important of the phenomena adverted to by Doctor Prout, *seeing, hearing, and thinking*.

That moiety of the task, therefore, which would prove, that the sensorial power is also identical with electricity, remains for Mr. Macnish and other aspiring physiologists. It may not be a very feasible achievement ; it may even be to any exercise of human ingenuity impossible ; yet it is not improbable, and may be

care-worn men, that sleep ill, with men of dull, easy, contented minds, that eat like horses, and think of nothing but the next meal, and lay their stupid heavy heads upon a pillow and instantly fall into a profound slumber. Neither of these classes can sleep well, unless they take a due portion of bodily exercise. If they do, Mr. Macnish may be assured, that they sleep equally well, unless, indeed, the latter be "a sluggish obtuse glutton," who devours more than is good for him; and in that case his nights are still more restless than those of his care-worn neighbour. His slumber, like Doctor Reid's, is "a torpor, similar to that which falls over the snaky monster of the wilderness when gorged with food,"* and approaches the nature of apoplexy rather than of sleep; whatever of it is sleep, I would ascribe to the pressure of the assimilative particles; whatever of

true, that the same material agent which excites the muscles of voluntary motion, in other words, moves the limbs as the mind wills, according to its inherent propensities, is also the material agent in communicating to the mind sensations or impressions from the external world. These two faculties have always ranked in the same class with our highest endowments; and the powers of willing, perceiving, feeling, recollecting, and reflecting, differ from each other but a shade in gradation and dignity. But whatever operation the electric fluid may have in producing any, or all of these effects, these effects are not electricity. It may stimulate the brain to feel, and to think, and the limbs to move; but the feeling and the thought are no more electricity than is the motion.

We are still in dark ignorance upon this, the most curious and interesting of human inquiries; and human sagacity may never be able to emerge from this ignorance; but we should welcome with gratitude, and not with opprobrium or neglect, any benefactor, who, like Dr. Philip, holds out his lamp to dissipate any portion of our darkness. It is not for me to arraign Dr. Prout of ingratitude to Dr. Philip; I merely wish that he had availed himself of his assistance, in his late Bridgewater treatise, just as in the same spirit I wish Dr. Philip had borrowed the aid of Gall, Spurzheim, and Combe, in his present inquiry. Had he done so, he would, in more instances than one, have greatly increased the value of his work; and he may be assured, that no future essayist in physiology, metaphysics, morals, jurisprudence, or political economy, can do justice to himself and the community, without a competent knowledge of the writings of these three philosophers.

* *Id. id.*

it is apoplexy, I would attribute to the pressure of the over-swollen blood vessels. Mr. Macnish, on the contrary, conceives, that "the sensorial power which kept the brain awake, is transferred by an easy process to the stomach, which, reinforced in this manner, acts vigorously, and enables the individual to fatten upon its labours. The two organs, he observes, are here reacting upon each other; in the one case the brain starving the stomach, in the other the stomach starving the brain, and giving a practical vindication of the Shakspearian aphorism, that "*fat paunches made lean pates.*"

Shakspeare, here, was obviously metaphorical; by "*lean*" he meant meagre of knowledge, not of flesh; for fat paunches are generally accompanied by fat pates, and both of them are unequivocal indications of the lymphatic temperament. The most usual accompaniment of this temperament is a large organ of alimentiveness; and if this propensity overbalances the influence of the various intellectual powers, the latter will lie fallow and unproductive, acquiring neither size or strength, while their more sensual companions will "fatten" on the nervous deposit, which, there is reason to presume, is abundant in proportion to the exercise of the organ, and thus contributes to the size of that fat, contented, ignorant brain, which entitles its lymphatic owner to the well-known sobriquet of "big head and little wit."

Mr. Macnish reserves his strong argument for the last, which he conceived would strike with fatal effect on my theory. He gives a consecutive detail of the whole process of digestion, observing, that "the drowsiness which takes place shortly after eating, seldom lasts above an hour or two, and that Mr. C. *would* say, that this arises from the brain being oppressed by the deposit within it, of *new particles* which must necessarily be derived from *the food lately taken.*"* But I have neither said so, nor *would* say so; what I have said on this point in my original essay, is directly the reverse, and is as follows: "It is true, that

* Id. 180.

sleep after meals is most irresistible while the food is still in the stomach, after digestion has commenced, and long before assimilation has taken its turn. But we are ignorant how far the arrival of new matter in the blood-vessels may instantly contribute to the deposition of the old; as an additional number of balls put into a tube at one extremity, will force out some of their predecessors at the other."

"I enter into no argument on the subject. I repose on the rational presumption, that sleep is something more than rest after fatigue—that it is probably the consequence of an important vital process in the delicate and fragile instruments of the mind—and that no process can be more requisite to those instruments, nor more likely to produce the effect, than the process of assimilation."*

Such, therefore, are my observations on this subject in my original essay. But Mr. Macnisk, in his theory of the sensorial power, appears to be a devoted disciple of the celebrated Darwin. In reference, therefore, to his master's authority, I might now remind him, that the process of assimilation frequently takes place, by means of particles which have escaped the three hours' sojourn in the duodenum, and the common circuit through the lacteals, the thoracic duct, the left subclavian vein, the lungs, the heart, and the arteries. But I rest not on the cited experiments of Munro, "who gave madder to some animals, having previously put a ligature on the thoracic duct, and found their bones and the serum of their blood coloured red;"† nor on those of Kratzenstein, Charles Darwin, Hughes, and others,‡ in some of which, nitre and asparagus shortly after they were taken into the human stomach, gave evident proofs of their presence in certain secretions, while at the same time they

* Transactions of the King and Queen's College of Physicians, vol. ii.; or Tilloch's Philosophical Magazine, No. liv. p. 258.

† Zoonomia, § 29. 2. vol. i. p. 354.

‡ Id. 359, 367, 371, 372,—see the whole section.

could not be detected in the blood ; nor do I rest on the other instances in which similar evidence is derived from various other facts equal satisfactory ; nor on any circumstance inconsistent with my original views. The nervous substance before it is deposited on the brain, must undergo all the sublimation and refinement it can receive in the most powerful and efficient laboratories of the frame, to fit it for its high and most important destination. This cannot, therefore, be the raw and unprepared material, hurried from the stomach to the head, by any short and narrow by-way. It must be the highly wrought, and elaborately animalized material, which has passed through every necessary process, and has advanced through the circulation to the very spot prepared to receive it. The nervous communication between the stomach and the brain, may announce with telegraphic despatch, that a new supply has arrived in the frame, and may stimulate, with the speed of electricity, the capillary terminations of the arteries, to deposit in abundance the congenial particles with which they have been furnished from a preceding supply of nutriment ; and, if the deposit be abundant, the sleep may be sudden and profound.

Of the truth and justness of this simple view, the instantaneous slumber which sometimes follows a dose of morphia, is at once an illustration or proof, and almost a demonstration.

Mr. Macnish, in his concluding paragraph, observes, that there are other points in my essay which he thinks could also be made the subject of criticism.* I do not controvert the supposition ; but, perhaps, on a reference to my original essay, he would find many, if not all, of these points already disposed of. I have not yet been assailed by an objection, that I found too truculent or sturdy to encounter : so far my hypothesis wears the semblance of truth. It is not of sufficient moment to take any farther trouble with it. That it should be admitted by future physiologists, as a conjecture not to be rejected as unsup-

* Phrenological Journal, No. xlii. p. 135.

ported and irrational, but one which may be considered as founded in nature and reason, explaining every circumstance, and removing every difficulty connected with the subject, is the highest point of ambition to which I can aspire. To bring it to the test of experiment, and demonstrate it to be an incontrovertible fact, is not within the scope of any investigation which I know how to institute. I do not see, even if it were established, that it could lead to any higher result, than the gratification of the careless curiosity of a few, upon a phenomenon, about which only a few are curious: or if to a higher, it may perhaps convey the important instruction, that we ought not to be satisfied with a shadow when we can grasp at the substance, nor with words, when we may probably attain to things. But even so, I have done as much as the matter in dispute will justify. Other objections may be started, and, if my theory be true, they will be as easily dissipated as their predecessors: but I should be ashamed again to take the field, even in the cause of truth, when the truth at issue is of such puny importance.

As this is the last time I shall approach the public on the subject, I may be pardoned if I still linger to obtrude a short and comprehensive view of my whole hypothesis, as I am at present disposed to maintain it.

The absorbents and secerning vessels never remit their offices; these conveying off the old particles from every part of the frame, and those depositing new ones in their places; the absorbents being most busy with the muscular fibres, which are most exercised by labour, or the nervous fibres most exercised by the operations of sensation, volition, and thought; yet these fibres, so exercised, are always the strongest and most powerful, of their kind, in the frame: the secerning vessels must, therefore, be equally busy in restoring new particles in the place of the old, or, during certain intervals, rather more busy, because more are restored than are taken away, as proved by the increase of size proportioned to the occasional or habitual exercise of the parts. Yet it is evident, that it is not during the

moments of exercise, that the great mass of new matter is deposited, otherwise the muscular and nervous fibres in question, would go on thickening and strengthening, the longer the exercise of labour and thought was continued ; and this we know is contrary to fact ; fatigue ensues, and rest is necessary ; and during that rest, it is probable, that the secerning vessels, though always depositing new particles, deposit much more, or the absorbents remove much less than at other times. By rest, I mean a mere cessation from labour, and such rest is not sleep. The large mass of new particles deposited on the muscles, cannot affect their tough and insensible fibres by any striking phenomenon ; but when such a mass is deposited on the delicate, tender, and sensible structure of the brain and nerves, how different must be the effect. If small in quantity, and while these organs are in a state of active energy, it may be hurried unobserved into the existing activity of the living matter ; but if large in quantity, and while these organs are resting from their labours, can it be, that the extraneous and unassimilated mass does not press its increasing weight on their fragile machinery, and produce an EFFECT something *like* the pressure of the over-swollen blood vessels, but natural, necessary, and healthful ; THE PARALYSIS, not of apoplexy, but OF SLEEP.

While the incumbent mass thus paralyzes the encephalon, the body is powerless ; there is no voluntary motion—no perception—no thought—no dream. But when the assimilation is complete in any one of the organs of the mind, then thoughts arise ; but there is no perception, until the assimilation is also complete in one or more of the organs of the senses ; until then, the simple current of our thoughts constitutes an ordinary *dream*. If the nerves of motion continue invested in a newly deposited mass of nervous matter, while the mind anxiously desires and essays in vain to move the limbs, this is *nightmare*. If these nerves are extricated from their trammals, and those desires and efforts of the mind still continue, if they command

and the nerves obey, this is *somnambulism*. But these dreams, whether ordinary, and natural, or attended with the horrors of nightmare, or the perils of *somnambulism*, vanish as our senses admit the impressions of the external world, we are then *awake*; but while thus awake, if the nerves of motion are still asleep, if their trammals still continue upon them, this is the *day-mare*, so feelingly described by Mr. Macnish. If, through any idiosyncrasy, the process of assimilation were never sufficiently considerable to paralyze, by the mass of new particles, the brain and nerves of sense, the individual would exist as one that *never slept*, even though his nervous system should obtain, in some degree, those blessings which are the peculiar concomitants of sleep, a sufficiency of nourishment, and a renovation of vigour. If, through an opposite idiosyncrasy, the deposit of new particles should be so superabundant and incessant, as to continue the paralysis beyond the usual and natural period of slumber, this state would present the rare, and hitherto mysterious phenomenon of *protracted sleep*, sometimes terminating even in death, as in Mr. Macnish's case of Elizabeth Perkins. These two opposite idiosyncracies seem to arise from opposite diseases of the discerning vessels of the head; one promoting to excess, and the other, in an equal degree, preventing the effusion of the due quantity of nervous matter, requisite for the healthy and vigorous state of the nervous system.

If it should be asked, How can the same cause operate in different ways?—How can the assimilating process at one time cause sleep, and at another not cause it?—How can it, though unremitting in activity, at one time paralyze the brain and nerves, and at another rather enliven and invigorate them? These questions are difficult, and the more difficult, because, in the material world we can find no object wherewith to compare and illustrate the phenomena of mind. The element of fire must suffice on the present occasion, when no better ligament of analogy between things so different can be had.

“Nutritur ventis, ventis extinguitur Ignis,
Lenis alit flammas, grandior aura necat.”

If a fire burns clearly, brightly, and fiercely, it requires a constant supply of fuel to keep up its intensity, and replace the solid particles expended in combustion. A small quantity, frequently added, so far from paralyzing, increases the activity of the fire; but when that activity is exhausted—when the very energy of the flames, like the exertion of a powerful mind, has wasted away the substance on which it fed, and these flames sink enfeebled, and the fire is diminished and dull, if you heap over it a heavy mass of fuel the flames are smothered, the activity ceases, the element sleeps. Hours are required to extend the vivifying influence to the new matter; at length the increasing warmth pervades the whole mass; the assimilation is complete, and the smallest incitement stirs up again all the energies of the furnace. If too little aliment be supplied to the glowing mass, it will burn out like an over-worked brain in similar circumstances; while too great a weight of fuel cast on the exhausted hearth, overwhelms the expiring embers, and the result is, the slumber of death not of sleep.

ART. VII.—*History of a unique Case of Heart Disease.* By
SAMUEL HANNA, A. M., M. B., one of the Physicians of the
Sick Poor Institution.

[Read before the King and Queen's College of Physicians.]

ALTHOUGH I am fully aware of the general inutility of recording individual cases, except where by serving as types or models of a class they tend to direct our practice, yet I am induced to offer the following case, (which I met with several years since,) by reason of its singularity; as in the course of my subsequent experience I have happened on nothing approaching to it, nor

on consulting a variety of authors,* who treat expressly on diseases of the heart, have I been able to find any lesion similar, much less identical.

J. B., æt. 31, possessed of extraordinary bodily strength and activity, and of a restless, enterprising character; had been in the habit of living freely. He had met with several severe falls from horseback, having been formerly riding master to a dragoon regiment, and latterly being engaged in training horses. He, however, always enjoyed good health till the present attack; its origin he states, as follows:—On 25th of last August, he received a severe fall on his back from a horse, but found no immediate bad effects from it; however, in a couple of days he experienced a sudden beating at the heart, along with sickness; for this he took an emetic, (which aggravated the symptoms,) and from this period he has been subject to continual palpitations. A short time after, he heard something crack loudly to the left of the middle of the sternum, and there immediately succeeded in the same spot a burning pain, shooting occasionally under the scapula and down along the arm; this pain continued for a considerable time, but has since ceased during the use of digitalis. Sometime afterward, whilst hunting, he was suddenly seized with palpitations so severe as to induce fainting; this was relieved by a bleeding from the arm. He has spat blood. Such is the history of his case, as he detailed it to me. When I saw him he was much emaciated and enfeebled; the usual symptoms of heart complaint were present; dyspnœa on motion, especially up ascents, orthopnœa, palpitations, dreams, and startings, cough, &c. Pulse rather small, but regular. The signs furnished by the stethoscope were—Between the second and third ribs, near the sternum, is heard a loud whirring rush of a fluid along with a double beat;

* Benevenius, Bonetus, Hollerius, Senac, Morgagni, Baillie, Corvissart, Laennec, Bertin, Andral, Stanley, quoted by Forbes, &c.

this is audible through the whole region of the heart, but is much loudest at the above point ; and the finger applied here perceives a very marked thrill, (“frénussement cataire”). The force of impulsion at this point is various, sometimes much exceeding what is natural ; and this not depending on palpitations. Percussion here returns a clear sound. I bled him, and put him on digitalis, hyoseyamus, &c. This occurred in the month of January. During the following month of February, the disease continued to make progress ; the œdema of ankles increased, though it never was excessive ; and the anguish from the feeling of suffocation became intolerable.

On the first of March, following the advice of a friend, he took some opium, (though from having witnessed in two or three cases of heart disease, death notably hastened by its use, I had warned him against it ;) when I visited him that evening, he said he was quite easy and happy ; but he was then evidently under the delusive influence of the opiate. On calling the following day, I learned, that shortly after my leaving him the preceding evening, he was seized with a fit of suffocation, and after ten minutes severe agony, had expired.—The following day I proceeded to make the examination of the body, but as several of the friends were present, the heart was the only organ I could inspect, and this too, hurriedly, as they were anxious to despatch the funeral. The pericardium contained about a naggin, or a little more, of clear serum ; the portion of it lining the heart was in parts dotted with red, and had here and there on its surface shreds of false membrane. The heart itself was two to three times its proper size. On making an incision from the origin of the aorta along the left ventricle toward the apex, I opened into a cavity, which I at first conceived to be that of the ventricle, but soon finding my mistake, and expressing my surprise at the appearance, I was permitted by the friends to remove the heart for further inspection. On returning home, I proceeded to examine the cavity ; it might contain a small orange, and was

formed in the external paries of the left ventricle ; it was separated from the cavity of the ventricles by what seemed the inner coat, transformed into a thick fibrous membrane, while in the outer wall, the muscular texture of the ventricle was quite effaced, as if by the effect of compression ; it was lined with shreds of coagulable lymph of various thickness, which easily peeled off. Just at the summit is seen a small, round, smooth opening, about two lines in diameter, leading at once into one of the sinuses of the aortic valve, and situated about four lines below the mouth of the coronary artery.

All the valves of the heart and of its vessels were sound ; the aorta was of natural dimensions, and otherwise healthy, except in a diffuse partial redness in a small space of its inner coat, which, however, disappeared after twenty-four hours' maceration. On the surface of the interventricular paries of the fifth ventricle, is an exactly circular patch of a white colour, about the size of a shilling ; this is formed by a softish layer of a plastic lymph, and is united only at its circumference to the lining membrane of the ventricle : corresponding to this patch the lining membrane has a shallow depression, and is more vascular than natural, shewing evident marks of inflammation.

On reading the preceding case, the question naturally arises as to the nature of the affection. It appears to me, to be an aneurism of the aorta developed in a most unusual situation ; indeed on the whole, a lesion to which, after consulting a variety of authors, I can find no precise parallel. The only question can be between this view of the matter, and an abscess in the substance of the left ventricle. Of this latter affection, there are not wanting several instances, but so imperfectly described, as to give little help in elucidating the question. Morgagni quotes three or four examples from the Sepulcretum of Bonetus ; but on reference to that work, these will be found to be little more than mere statements of the existence of abscesses, without any anatomical detail. His object in quoting

these cases, was only to ascertain, whether syncope and intermissions of pulse were necessary symptoms of this affection, (a question by the way which he decides in the negative). Now, not to mention that abscesses, situated in the heart, are rather infiltrations of pus among the muscular fibres, it would be hard to conceive such a cavity left completely empty of pus, except we are to regard it as the consequence of the softening down and subsequent removal of a large tubercle, for these have not unfrequently been found in the heart's substance. But every thing in the history of the case, as well as in the constitution of the individual, disproves such an opinion; as he was of an eminently robust habit, and the attack was sudden, bearing in it all the characters of an acute inflammation. I may here also refer to the authority of Andral, who states, that he never found tubercles in the heart, except they existed at the same time in other parts of the body. In the case under consideration, there was no symptom of such, and the lungs, superficially examined, shewed no sign of their presence.

The heart is deposited in the museum of the Park-street School.

ART. VIII.—*Remarks on the Pathology of Abscesses on the Surface of the Neck, with illustrative Cases.* By R. FRORIEP, M. D., Berlin.

ANATOMICAL CONSIDERATIONS.—The cellular tissue of the neck is disposed so as to be continued from the upper part of the neck beneath the under jaw, chiefly in *three* principal parts; namely, first, on the anterior inner side of the vessels of the neck to the side of the trachea, as far as the superior border of the mediastinum; secondly, on the external side of the same vessels to the space above the first rib, from which the cellular tissue divides,

partly toward the mediastinum, and partly to the axilla; thirdly, on the side of the neck down to the adipose tissue, between the clavicle and the scapula, and between the latter and the lateral surface of the thorax downwards. It follows, from this arrangement, that fluids which are formed in the cellular tissue of the neck, if they make progress, extend in one of these ways, in case such formations have not their seat immediately under the skin upon the external surface of the fascia superficialis.

Besides the loose cellular tissue, we know that two separate fasciæ are to be distinguished in the neck; the fascia superficialis (colli), which corresponds to the fascia superficialis of the remainder of the body, and the proper fascia colli, which is analogous to the sheaths of the muscles, as they are most perfectly developed in the extremities, (for example, as fascia lata femoris), and, in strong muscular subjects, receives a texture as manifestly fibrous as the fascia of the thigh or of the arm themselves.

Between the cutis and the fascia superficialis lies upon the under jaw and along its inferior edge as well as upon the whole upper fourth of the neck, a thick layer of a fibrous cellular tissue, furnished with many adipose cells, in which inflammations and suppurations become isolated with as great facility as in the fibrous layers of cellular tissue in general. But on the boundary of the superior fourth of the neck this fatty layer terminates, passing here into a layer of laminar cellular tissue, lying immediately under the cutis, the continuation of which may be followed, above and behind the fibrous cellular tissue of the region of the chin. This laminar cellular tissue is continuous over the edge of the clavicle and of the sternum, on the external surface of the neck, without forming a firm attachment to these parts. Beneath it, in the middle line, a small quantity of loose cellular tissue exists, and on both sides the fibres of the platysma myoides muscles, and deeper still, a second layer of laminar cellular tissue, which lies upon the posterior surface of the platysma myoides, and may be pursued into the fascia

superficialis of the face, and also of the chest, but is somewhat closely attached upon the edge of the lower jaw-bone and the anterior side of the clavicle, so as in these situations to afford some obstacle to the progress of fluids which are effused under the fascia superficialis; and if the fascia superficialis be cut across in the middle of the neck and reflected upward and downward, it appears to be immediately continuous in these places with the fascia colli, which is also attached to the edge of the lower jaw and to the clavicle. This second layer of the fascia superficialis, owes its origin merely to the circumstance of the muscular expansion of the platysma myoides existing in the tissue of the fascia itself. Immediately behind it, and connected with it by a loose, irregular, cellular tissue, lies the fascia colli propria, which is displayed in muscular men as a perfect tendon sheath, and possesses the following arrangement. Upon the middle line, over the largest and the superior part of the trachea, it consists of a simple but very strong lamina, which, laterally, immediately at the edge of the sterno-hyodeus muscle splits into two lamina, the most superficial and stronger of which, proceeding laterally, reaches the anterior edge of the sterno-cleido-mastoideus, gives this a covering before and behind, again unites into one lamina at its posterior edge, and then reaches the muscles of the neck, where it is not necessary here to pursue it. The lamina which lines the posterior surface of the sterno-cleido-mastoideus is continued, interiorly, by two cellular lamina, which form a sheath for the omo-hyoideus muscle, and also pass into the sheaths of the muscles of the neck. The deeper lamina of the fascia colli of the middle line, proceeding laterally separate from the superficial lamina already described, forms sheaths for the sterno-hyoid and sterno-thyroid muscles, and for the bundle formed by the jugular vein, carotid and nervus vagus; it overlays, moreover, the thyroid gland at its anterior surface with a very firm lamina, which is intimately connected at the edge of the gland with a cellular tunic, which lines its posterior surface, and thus forms

a portion of a perfect covering of the thyroid gland. But the fascia colli, in the middle line, on the anterior surface of the thyroid cartilage forms a single lamina, which, however, pursued downwards upon the middle line, is found to divide, at the upper border of the thyroid gland, into two laminae, which, at the inferior edge of the same, become again closely connected by a dense cellular tissue, yet afterwards they proceed downwards as two separate laminae. The thicker external one of these then descends a short way as a single lamina, but afterwards it likewise splits into two very thick fibrous laminae; the first of which unites with the superior edge of the sternum, and, laterally, forms the part of the fascia colli, already described, which invests the sterno-cleido-mastoideus with a sheath; whilst the second lamina proceeds straight downwards between the interior edges of the sterno-hyodei muscles to the posterior surface of the sternum, becomes here firmly attached, and is then continuous with the superficial cellular tissue of the anterior mediastinum; laterally it gives off sheaths for the sterno-hyoid and sterno-thyroid muscles, and then enters into connexion with the sheaths of the vessels of the neck; still more profoundly upon the middle line, a third lamina of the fascia colli proceeds downwards, as a covering of the trachea, and joins the cellular tissue of the posterior mediastinum, and the sheaths of the cervical muscles at their attachments to the transverse processes of the vertebræ. Between the three laminae of the inferior part of the fascia of the neck, on the middle line just described, two interspaces are found, one between the superficial lamina, attached on the external side of the sternum, and connected with the sheath of the sterno-mastoid, and the second, which is applied to the posterior surface of the sternum, and is in connexion with the sterno-hyoid; the other, between the last and the immediate covering of the trachea itself. Both of these interspaces contain a very loose adipose cellular tissue, which is, in the first of them, isolated by means of a laminar layer of cellular substance, which connects laterally the super-

ficial lamina with that covering the sterno-thyroid muscle. The deeper space, on the contrary, is in immediate connexion with the cellular tissue of the lateral parts of the neck, and is separated from that of the mediastinum merely by one or more cellular laminae, which bring the second and third laminae of the fascia colli into connexion.

Between these various lamina, thus forming partitions for all the muscles and vessels of the neck, there is every where found a loose cellular tissue, in some places containing fat; at the inferior half of the neck, anteriorly, the following spaces containing adipose cellular tissue, are to be remarked; first, a triangular space immediately over the superior edge of the sternum; second, a much larger one immediately behind this, but separated from it by a firm cellular layer; third, a cellular space proceeding upwards from the second, between the thyroid gland and the trachea on one side, and the sheath of the vessels on the other; this space passes upwards into the cellular tissue in which the submaxillary gland lies; fourth, the cellular space between the posterior edge of the sterno-cleido-mastoid, the posterior side of the vessels of the neck, and the anterior surface of the scaleni muscles. In this space lies the greatest number of the more superficial lymphatic glands of the neck, and it is continued, inferiorly, along the carotid and subclavian into the mediastinum; superiorly into the cellular space between the ascending ramus of the lower jaw, and the muscles of the neck; fifth, the space between the scaleni and the edge of the trapezius (*cucullaris*). This contains the brachial plexus, inferiorly, is immediately in connexion with the adipose cellular tissue of the axilla, and superiorly, by means of the cellular space behind the ascending ramus of the lower jaw, unites with that marked number four.

If we now apply the knowledge of these spaces containing cellular tissue, with the view of exposing, in a general manner, the prognosis of suppurating inflammations of the different parts of the neck, it will be found to follow, that suppurations

in the fascia superficialis should have little tendency to take a profound course, but incline rather to extend upon the external surface of the chest. If, however, the purulent effusion take place between the fascia superficialis and the fascia colli, in consequence of the firm attachment of the fascia superficialis to the clavicle, it is stopped at the inferior border of the neck, and here compelled either to burst externally through the fascia superficialis, or internally through the fascia colli. If the lymphatic glands which descend over the brachial plexus on the external side of the cervical vessels suppurate, the pus will more probably make its way through towards the axilla and the sides of the thorax. If the secretion of pus occur in the deep lying cervical glands on the posterior edge of the sheath of the carotid, or the cellular spaces between the under jaw and the anterior edge of the cervical muscles, (as most frequently is the case in scrofulous subjects,) the natural progress of the pus is along the posterior edge of the cervical vessels downwards, to the origin of the subclavian, and from hence into the mediastinum. Again, if the cellular parts or the glands, in the space in which the sub-maxillary gland lies, suppurate, the pus easily finds its way downwards, along the thyroid gland and the trachea, and on account of the deep situation of this space, may extend far, and reach into the mediastinum, without being recognized externally. Finally, if the pus occurs in the cellular space immediately above the manubrium of the sternum, either by original formation in this place, or by a suppuration of the fascia superficialis having made way into it, the great probability is, that if an exit for the pus be not procured by artificial means, it will penetrate into the mediastinum.

The following cases are illustrative of these general remarks. They refer to the cellular spaces of the neck, which have been indicated by the numbers three, four, and five.

CASE I.—*Suppuration of the Cellular Tissue between the Clavicle and the Scapula—Denudation of the Ribs and of the Pleura.*

The 22nd January, 1834, Christian Kunze was received into the department for sick children, in the Charité, Berlin. This boy, who was well formed, had some time before fallen down a stairs, and received contusions chiefly in the right shoulder and the region of the hip. His parents had let a considerable time pass before they called a medical man, and concealed from the latter the cause of the injury; so that he considered, that he had to deal with a disease of the hip-joint, from constitutional causes; and for this applied stimulating means, which gave rise to a smart fever, assuming the nervous type, and rapidly exhausting the strength of the patient. In this state, greatly emaciated, with facies hippocratica, small rapid pulse, loss of consciousness, and low delirium, the patient arrived at the Charité; the dry tongue, together with the lips and the teeth, was covered with a firm brown mass of coating. Several collections of matter were found on the body; namely, the affected hip-joint was swollen, deeply reddened, and shewed evident fluctuation; the head of the femur was luxated backwards and upwards; the right shoulder was also considerably swollen, red, and fluctuating; the humerus also seemed to be pushed upwards; above the shoulder was found on the right side of the neck, a large abscess, which extended from the middle of the neck, posteriorly to the spine of the scapula, and anteriorly under the clavicle; moreover, there existed a fracture with collection of pus at the inferior end of the radius of the right hand, and also fracture, with suppuration of the middle finger of the first phalanx. All these purulent cavities were opened, and by this means freed of about two quarts of matter, which was in the shoulder and hip-joints, sanguineous and unconnected, but in the other places, whitish yellow, and tolerably consistent. In spite of the most careful treatment, it was not possible to preserve the life of the patient for longer than

six days. The following was the result of the dissection, which was performed forty-eight hours after death.

The opening of the right hip-joint discovered a dislocation of the femur, the head of which lay upon the external surface of the ilium posteriorly and superiorly: the great trochanter, and a part of the neck of the thigh bone were torn off, and drawn upwards by the operation of the glutei muscles. The acetabulum was normal. The ligamentum teres, and the capsular ligament, were torn, and gelatinously softened. The cartilaginous covering of the head of the femur was partially absorbed: moreover, nearly all the soft parts in the neighbourhood were infiltrated, and the upper half of the thigh bone deprived of its periosteum, by the deposit of a thin unconcocted pus, which flowed out from an incision made into the thigh. Over the ischium there was a cavity filled with dirty yellow pus, forming a short sack, in which two of the transverse processes of the sacrum were laid bare, but not denuded of their periosteum or become carious. A similar destruction was found at the right humerus; the os humeri was luxated upwards, without laceration of the capsular ligament, the cartilage of the head of the bone was absorbed, and the articular cavity filled with pus. In the elbow joint the epiphyses of the os humeri were loosened immediately at the cartilaginous intermediate layer, so that the external and internal condyle were separated, and a considerable quantity of matter was found in the joint itself. At the inferior end of the radius, the epiphysis was also broken off, and the inferior half of the radius bared of its periosteum. The wrist joint was filled with matter. In like manner the metacarpal end of the first phalanx was separated at the epiphysis, and the joint filled with matter. But the largest quantity of matter was found in a cavity of the size of a goose egg, which, on the right side of the neck, projected between the sterno-cleido mastoid, and the trapezius, (*cucullaris*,) and anteriorly and interiorly on the clavicle over the first rib, by a smaller, yet a considerable opening, was connected

with a very large sac of matter on the outside of the thorax : this inferior cavity extended down to the edge of the fourth rib, and reached from the point of insertion of the costal cartilage, to the posterior fourth of this rib, or to the posterior border of the scapula. All the four ribs were in the middle of the cavity bared of their periosteum, exhibiting a rough surface, and between these denuded places of the second, third, and fourth ribs, the intercostal muscles were for the length of an inch perfectly destroyed, so that the inferior abscess sac was separated from the right cavity of the chest, merely by the thin membrane of the costal pleura. The purulent cavity in the neck, and that on the external surface of the thorax were distinguished from one another also by this, that the former possessed a tolerably thick lining wall, consisting of condensed cellular tissue, (probably in consequence of inflammation of this tissue), on the latter, contrariwise, a new cellular tunic of such a kind was not to be detected. This, as well as the circumstance, that the upper cavity was connected with the under by a somewhat narrow opening, would perfectly justify the idea, (if any doubt could prevail on the subject), that the pus had sunk down from the surface of the neck to the thorax.

It is not necessary for our purpose to quote more of the appearances which this case presented ; there were suppurations likewise in several places of the adipose cellular tissue ; and the viscera of the head, the chest, and the abdomen, were unaltered, except some enlargement of a few of the mesenteric glands.

CASE II.—*Abscess of the Cellular Tissue behind the Inferior end of the Sterno-cleido Mastoid, and Communication of the same with the Heart, by means of the Vena Cava Superior, and with the Lungs, by the anterior Mediastinum.*

On the 14th January, 1834, John Knuth, labourer, ætat 28, was admitted into the Charité, and had then, on the right side of the neck, above the clavicle, and under the sterno-mastoid, a glandular abscess, which, by means of cataplasms, was matu-

rated and opened. Several purulent sinuses were exhibited in different directions, particularly towards the shoulder, which were opened, and then the suppurating surface took on the aspect of a scrofulous herpetic ulcer. Active granulations were produced, by dressing with stimulating ointments, and the patient's condition was very satisfactory. In the beginning of the month of April, however, induration exhibited itself in the part, discoloration also in various places, and finally, copious secretion of pus, which flowed more particularly by pressure from below upwards. Several new sinuses were now evident, into which the probe penetrated in various directions. At this time the constitution of the patient became affected, vehement thirst came on, with a small rapid pulse, and continued cough. The external wound was kept open by tents. In the month of May, all the phenomena of tubercular phthisis has gradually formed, and pressure in the neighbourhood of the sinus gave issue only to a small quantity of ill-conditioned matter. On the 8th May, the fistulous abscess was again cautiously probed, and at this the thin elastic catheter which was used for the purpose, took for the first time a direction downwards, and to the left, so as to appear as if penetrating into the anterior mediastinum. But the probing instrument had scarcely been a few seconds in the fistula, when the patient's face lost colour, his eyes became fixed, and his arms assumed almost a cataleptic stiffness. He fell into a faint, from which, however, he was easily revived in the usual manner, and then some frothy blood was thrown up by coughing, and from the fistula also, some matter mixed with blood issued. The pulse was little changed, and not more excited than before the exploration; but a feeling of tightness attacked the chest, so that immediately twelve ounces of blood were drawn from a vein. The above described condition, which was brought on by the probing, now occurred frequently, the pectoral anxiety increased, the respiration became disturbed in the highest degree, and at length became abdominal; and the extremities became stiff and immoveable. Finally,

death occurred on the 16th May, with all the phenomena of pulmonary disease. Dissection disclosed the following appearances :

The external opening of the abscess of the neck was situated an inch and a half above the anterior half of the right clavicle: it had the appearance of a purulent surface upon an indurated base. Between this surface and the clavicle lay a row of swelled, hardened, and partly suppurated lymphatic glands. The purulent surface was continued laterally under the sterno-cleido mastoid, by a canal about an inch wide, which was lined in all directions by indurated cellular tissue. Inferiorly, a funnel-shaped cavity existed in the surface of the abscess, into which, without the least difficulty, a thin flexible catheter could be introduced its whole length interiorly and inferiorly. This was left so, and the clavicle cautiously taken away; it was then found, by a long and difficult dissection, that the commencement of this fistula existed precisely in the angle formed by the union of the subclavian and internal jugular vein, that is, where these unite to form the vena cava superior. In this angle the venous tunic was perforated by an opening of the size of a crow's feather. This opening had smooth, loose edges, overlaid with pus. The coats of the vein were neither in the jugular, nor subclavian, nor in the vena cava superior, inflamed, nor otherwise altered; the probe introduced through the opening, went immediately by the superior cava into the right auricle of the heart, and, beside, it was a coagulum of blood, in which not the smallest trace of mixture of pus could be observed. The portion of the surface of the abscess which was prolonged under the inferior part of the sterno-mastoid, sent forth two very narrow fistulæ, containing but little matter, and not surrounded by a cellular lining, into the superior part of the anterior mediastinum, in which a tumour of the size of a walnut, filled with the peculiar cheesy tubercular matter existed, which was in connexion with the superior lobe of the lung, here incorporated with the mediastinal pleura. The right lung

was full of tubercles, in all stages of development, amongst which were several middle-sized cavities. The left lung also contained an innumerable quantity of softening tubercles, with some small cavities. In the abdominal cavity, a small quantity of fibrous exudation was observable on the intestines; excepting which, all was in the normal state, and no trace of purulent deposit was found in any organ.

This case furnishes instructive and interesting data, in reference to the connexion of the cavity of an abscess with the cavity of a vessel, and also in reference to the question, as to whether tubercles stand in a causal relation with this connexion; but these circumstances are here omitted, and it is sufficient for our purpose to have quoted this rare case, as an example of the sinking of matter on the external side of the vessels of the neck into the mediastinum. As to the third variety of purulent deposit in the neck, in which the pus is formed at the inner side of the cervical vessels, between these and the windpipe, and sinks into the anterior and posterior mediastina, cases of this kind are found in all surgical works.

We would briefly add the following notes of a third case, the pathological interest of which is apparent. A man, aged 30, (in Prof. Dieffenbach's division for surgical patients in the Charité), had several fistulous openings along the left side of the trachea, from the middle of the neck to the manubrium of the sternum, through which, for a long time, a considerable quantity of pus had been evacuated, until one day this evacuation suddenly ceased, although the fistulæ still remained perfectly open. By degrees a series of symptoms set in, which in a little time placed it beyond doubt, that a deposit of pus had formed in the anterior mediastinum. Soon afterwards, a small swelling arose between the sternal ends of the cartilages of the third and fourth rib, which became red, fluctuated, and being opened, gave free issue to the matter out of the mediastinum. Soon again, a similar pointing of matter formed over the middle of the sternum, where also now a fistula exists,

which by a round opening in the sternum, leads into the mediastinum, and affords here a second exit for the pus. The general condition of this patient is satisfactory, and leaves ground for hoping, that in his case the deposit of matter will not terminate unfavourably.—*Medizinische Zeitung*, July 9, 1834.

BIBLIOGRAPHIC NOTICES.

Experiments and Observations on the Gastric Juice and the Physiology of Digestion. By WILLIAM BEAUMONT, M. D. Plattsburgh, 1833.

WE have not been able to procure a copy of the original work of Doctor Beaumont, and consequently are obliged, like an esteemed London cotemporary, to content ourselves with an admirable analysis of it given in a recent number of the American Journal of the Medical Sciences.

We feel less compunction in transferring to our pages any article of merit which may appear in the Medical Reviews of our Transatlantic brethren, for they have set us the example, (we refer to the fact with pride,) and are constantly in the habit of inserting very long extracts from the *Dublin Journal of Medical and Chemical Science*. Thus, in the Baltimore Medical and Surgical Review, April 1834, we find in the Quarterly Summary of Intelligence forty articles, most judiciously selected, and exhibiting an excellent view of the progress made in the Medical Sciences during the preceding three months: of these forty articles, fourteen are taken without any alteration from the Dublin Journal! We might appeal with equal satisfaction to the other numerous and talented periodicals published in the United States, for ample testimony to prove that the results of our humble labours have been judged by the American Editors worthy of frequent re-publication; indeed we doubt whether, with the exception of the Medico-chirurgical Review, edited by Dr. Johnson, any British periodical devoted to medical subjects has excited so much attention in America, as the Dublin Journal.

The judgment of cotemporaries, in space so far removed, is not less valuable on account of its impartiality than the opinion of posterity upon the merits of any literary undertaking, and enables us, as it were, to anticipate the decision of the latter. In France all the leading Journals, both in the capital and provinces, quote our Periodical both frequently and with

approbation; indeed almost every number of the *Archives Generales de Medecine*, a work conducted with the greatest talent, and enjoying a most extensive circulation, contains some of our articles often translated without abbreviation.

In the very first number of a medical Gazette lately published at Madrid, and which is the only work of the sort that city can boast of, we find our Journal quoted.—Were we to notice the various journals of Italy, Switzerland, and Germany, in which we have observed with pleasure frequent and favourable notices of the original contributions of our friends, we could swell the catalogue to a length, which, however gratifying to our vanity, would be tiresome to our readers.—We therefore have done, having produced abundant testimony to shew that the efforts of those numerous and able friends who have kindly contributed so much valuable matter, have not been thrown away, and that the results of their labours have not been buried in a corner.

Do we refer to this honourable and decisive testimony in our favour merely for the purpose of vain glorious boasting, and in order to gratify our Editorial vanity? Certainly not. We have ever most carefully avoided the unseemly office of self-gratulation, and would have gladly continued this line of conduct, had we not felt ourselves constrained by a sense of duty to bring forward some proofs of the extensive circulation our Journal enjoys both in the new world and in the old, in order to furnish our readers with facts calculated to refute the observations of a writer in a recent number of the *Lancet*. With a fellow-citizen, anonymous as a critic, without name as a lecturer, and obscure as an author, we are not inclined to enter into controversy, and have therefore advisedly used the word observations instead of calumnies. To the Editor of the *Lancet* we offer our best thanks for his hostility.

In going through life, a wise man may boast of judgment in the selection of friends; but not so with regard to the choice of enemies.—We owe these to chance or destiny, and surely we can blame neither, when we examine the short list of those who have ranged themselves against us! Long may the Member for Finsbury form a centre of attraction calculated to purify society by drawing to himself all kindred spirits; long may the Liffey bear its deposits into the Thames;* long may the subterraneous drainage and anonymous filth of Dublin seek a distant vent in the literary cess-pool of the metropolis, the *cloaca maxima* of London.

* In Tiberim defluxit Orontes.—*Juvenal*.

When we consider the conduct of persons who, like the writer in the *Lancet*, have attacked all the public medical institutions of Dublin with virulence duly supported by falsehood, we find it difficult to imagine what reward they seek, unless that by working evil secretly, they insure the silent approbation of a perverted conscience.

In the following extract from our American cotemporary, we have given about half of his able analysis, and have not thought it advisable to enter further upon the subject, as we are convinced that the part we have selected contains all the facts of value observed by Doctor Beaumont.

“The subject upon which the experiments of the latter were performed, was a young man, of a good constitution, robust and healthy, who, on the 6th of June, 1822, he being then eighteen years of age, was accidentally wounded by the discharge of a musket loaded with buck-shot. The load entered his body posteriorly, and in an oblique direction, forwards and inwards, literally blowing off a portion of the integuments and muscles of the size of a man’s hand, fracturing and carrying away the anterior half of the sixth rib; fracturing the fifth: lacerating the lower portion of the left lobe of the lungs and the diaphragm, and perforating the stomach. On examination, twenty-five or thirty minutes after the accident, a portion of the lung, as large as a turkey’s egg, was found protruding through the exterior wound, lacerated and burnt, and immediately below this, was ‘another protrusion, which, on further examination, proved to be a portion of the stomach, lacerated through all its coats, and pouring out the food’ that had been eaten in the morning, ‘through an orifice large enough to admit the forefinger.’

“It is unnecessary, on the present occasion, to follow out the surgical details of the accident and its treatment. For seventeen days every thing that was taken by the mouth soon passed out at the wound, and the only manner in which the patient was sustained, was by nutritious injections per anum. During this period alvine evacuations could not be obtained, notwithstanding cathartic enemata were given, and various other means adopted to promote them. As soon, however, as compresses and adhesive straps could be applied over the opening into the stomach, and food was retained in the latter, by the aid of purgative injections, a very hard, black, fetid stool, was procured, followed by several similar ones; after which the bowels became quite regular, and continued so.”

“No sickness, nor unusual irritation of the stomach, not even the slightest nausea, was manifest during the whole time; and after the fourth week, the appetite became good, digestion regular, the alvine evacuations natural, and all the functions of the system perfect and healthy.

“By the adhesion of the sides of the protruded portions of the stomach to the pleura costalis and the external wound, a free exit was afforded to the contents of that organ, and effusion into the abdominal cavity was thereby prevented.”

“Cicatrization and contraction of the external wound commenced in the fifth week; the stomach became more firmly attached to the pleura, but the orifice still remained open. This resembled, in every thing but the absence of a sphincter, the natural anus, with a slight prolapsus. At every dressing it allowed the contents of the stomach to flow out, in proportion to the quantity recently taken, and when the stomach was empty, or nearly so, a partial inversion would take place, unless prevented by the application of the finger.”

“‘Frequently, in consequence of the derangement of the dressing, the inverted part would be found of the size of a hen’s egg. No difficulty, however, was experienced in reducing it by gentle pressure with the finger, or a sponge wet with cold water, neither of which produced the least pain.

“‘In the seventh week—the circumference of the external wound was at least twelve inches, and the orifice in the stomach nearly in the centre, two inches below the left nipple, in a line drawn from this to the point of the left ilium.’”

“The food and drink taken into the stomach were prevented from escaping through the perforation by a compress and tent of linen kept on by adhesive strips.

“By the sixth of June, 1823, one year from the occurrence of the accident, the injured parts were all sound and firmly cicatrized, with the exception of the perforation leading into the stomach, which was about two and a half inches in circumference. From this time the patient continued gradually to improve in health and strength, and the newly-formed integuments became more and more firm.”

“‘At the point where the lacerated edges of the muscular coat of the stomach and intercostal muscles met, and united with the cutis vera, the *cuticle* of the external surface, and the *mucous membrane* of the stomach *approached* each other very nearly. They did not unite, like those of the lips, nose, &c., but left an intermediate marginal space, of appreciable breadth, completely surrounding the aperture. This space is about a line wide, and the cutis and nervous papillæ are unprotected, and as sensible and irritable as a blistered surface abraded of the cuticle. This condition of the aperture still continues, and constitutes the principal and almost only cause of pain or distress experienced from the continuance of the aperture, the introduction of instruments, &c. in the experiments, or the exudation of fluids from the gastric cavity.’”

“Compresses and bandages were constantly demanded, to prevent the escape of the food from the stomach, until the winter of 1823-4; at this period a small fold or doubling of the inner coats of the stomach appeared, forming at the superior margin of the orifice, slightly protruding, and increasing in size until it filled the aperture. This valvular formation adapted itself to the opening into the stomach, so as completely to prevent the efflux of the gastric contents when the stomach is full, but was easily depressed by the finger. When the stomach is empty it plays up and down simultaneously with the respiratory muscles.

“In the spring of 1824 the individual had perfectly recovered his natural health and strength. The aperture in the stomach still remained, but the surrounding wound was firmly cicatrized to its edges. From this period to the present time he has enjoyed general good health. He has been active, athletic, and vigorous; exercising, eating, and drinking, like other healthy and active people. For the last four months, (of the autumn of 1833,) he has been unusually plethoric and robust, though constantly subjected to a continued series of experiments on the interior of the stomach; allowing to be introduced or taken out, at the aperture, different kinds of food, drinks, various instruments, and the different contents of the stomach, almost daily, and sometimes hourly.

“The perforation through the coats of the stomach is situated about three inches to the left of the cardia, near the left superior termination of the great curvature. On pressing down the valve when the stomach is full, the contents flow out copiously.”

“‘When the stomach is nearly empty and quiescent, the interior of its cavity may be examined to the depth of five or six inches if kept distended by artificial means; and the food and drinks may be seen entering, if swallowed at this time, through the ring of the œsophagus. When entirely empty, the stomach contracts upon itself, and sometimes forces the valve through the orifice, together with an additional portion of the mucous membrane, which becomes completely inverted, forming a tumour as large as a hen’s egg. After lying on the left side, and sleeping a few hours, a still larger portion protrudes, and spreads out over the external integuments, five or six inches in circumference, fairly exhibiting the natural rugæ, villous membrane, and mucous coat (?) lining the gastric cavity. This appearance is almost invariably exhibited in the morning, before rising from bed.’”

“Dr. Beaumont commenced his first series of experiments in May, 1825; in the month of August ensuing, the young man upon whom they were performed, returned to Canada, of which place he was a native, where he remained four years. In August, 1829, he came again to the United States, and entered into the service of Dr. B., when the latter commenced a second series of experiments, and continued them uninterruptedly until March, 1831. Soon after this period circumstances made it expedient for the subject of the experiments to return, with his family, again to Canada. In November, 1832, he once more came back and engaged himself to Dr. B. for twelve months, for the express purpose of submitting to another series of experiments, which were performed on him at Washington, and continued to March, 1833. In July of the same year, a fourth series of experiments were commenced at Plattsburgh, New York, and completed on the 1st of November, 1833.”

“‘The usual method of extracting the gastric juice, for experiment, is by placing the subject on his right side, depressing the valve within the aperture, introducing a gum-elastic tube, of the size of a

large quill, five or six inches into the stomach, and then turning him on the left side, until the orifice becomes dependent.

““ On introducing the tube, the fluid soon begins to flow, first by drops, then in an interrupted, and sometimes in a short continuous stream—Moving the tube about, up and down, or backwards and forwards, increases the discharge. The quantity of fluid ordinarily obtained is from four drachms to one and a half or two ounces, varying with the circumstances and condition of the stomach. Its extraction is generally attended by that peculiar sensation at the pit of the stomach, termed sinking, with some degree of faintness, which renders it necessary to stop the operation. The usual time of extracting the juice is early in the morning, before eating, when the stomach is empty and clean.’”

“The fluid obtained in this manner, when unmixed with any thing excepting a portion of the mucus of the stomach, with which it is perhaps always combined, is clear and transparent, inodorous, a little saltish, and very perceptibly acid to the taste; having the flavour, when applied to the tongue, of thin mucilage slightly acidulated with muriatic acid. It is readily diffusible in water, wine or spirits; slightly effervesces upon the addition of alkalies; possesses the property of coagulating albumen in an eminent degree; is powerfully antiseptic, checking the putrefaction of meat, and effectually restoring the healthy action when applied to old, foetid sores, and foul ulcerating surfaces. When not separated by filtering, the mucus combined with the fluid gives to it a degree of ropiness, but soon falls to the bottom in loose white flocculi. Saliva imparts to the gastric fluid an azure tinge and frothy appearance.

“Equal parts of the gastric fluid and alcohol, mixed together and agitated, produced a turbid, milk-white fluid, upon the surface of which, after standing at rest, was formed a thin white coat of fine loose coagula. When the alcohol was first added to the fluid, and before the two were mixed by agitation, the latter settled to the bottom while the alcohol remained on the top, indicating that its specific gravity was less than that of the fluid.

“The sensible properties of the gastric fluid are changed by a variety of circumstances; as by the admixture of saliva, water, mucus, and occasionally bile, perhaps, also, pancreatic juice. Derangement of the digestive organs, slight febrile excitement, fright, or any sudden emotion of the mind, occasions, also, material alterations in its appearance. Excess in eating causes a rancid state of the fluid, by which its solvent action is retarded. Dr. Beaumont conceives, however, that the special solvent itself—the *gastric juice*—is, probably, “invariably the same substance.” The correctness of this latter opinion, the experiments before us are far, however, from establishing. It would be an interesting inquiry, which we are somewhat surprised Dr. B. has never thought of instituting, to ascertain whether the composition of the gastric juice is not varied according to the kind of aliment to which the individual is confined. According to MM. Chaussier, Virey, Pinel, and Voisin, the properties of the solvent fluid secreted by the stomach differ in different classes of ani-

mals, and in the human subject at different periods, and that this difference has a direct relation to the nature of the food. The first mentioned gentleman states, that its acidity is the greatest in herbivorous animals, the least in the carnivorous.

“In regard to the composition of the gastric fluid, a portion examined by Professors Dunglison and Emmett, was found to contain free *hydrochloric* and *acetic* acids, *phosphates* and *hydrochlorates*, with bases of *potassa*, *soda*, *magnesia*, and *lime*, and an animal matter soluble in cold water, but insoluble in hot. The existence of free *hydrochloric* acid in the gastric fluid was also evinced in the portion examined by Professor Silliman; in all other respects, however, the analysis of the latter gentleman is any thing but satisfactory.

“The result of Professors Dunglison and Emmett’s analysis corresponds very nearly with that of Tiedemann and Gmelin, who found the gastric fluid to contain, besides mucus, osmazome, and salivary matter, hydrochloric and acetic acids, alkaline sulphates and hydrochlorates, the alkali being chiefly soda; phosphate and muriate of lime and other salts in minute proportions.

“Leuret and Lassaigne state the component parts of gastric juice to be water, hydrochlorate of ammonia, chloride of sodium, mucus, an animal principle soluble in water, phosphate of lime and lactic acid; they deny, however, the existence in it of free hydrochloric acid.

“Now, as the lactic acid of Leuret and Lassaigne has been shewn by Berzelius, to be merely a variety of the acetic, the existence of the latter in gastric juice may be considered as settled; while the researches of Prout, Children, Graves, Tiedemann and Gmelin, borne out as they are by the analysis of Dunglison, Emmett, and Siliman, establish likewise, we conceive, beyond the possibility of doubt, the presence of the hydrochloric acid in a free state.

“The solvent power of the gastric juice, in relation to which so much doubt and uncertainty have heretofore existed, is proved in the most conclusive manner by Dr. Beaumont. It can never again become a subject of dispute. Almost every variety of alimentary matter, whether animal or vegetable, when submitted to the action of the fluid taken from the stomach, and kept at a temperature of about 100° Fahrenheit, was found to become, in a few hours, completely softened and reduced to a paste, resembling very nearly the contents of the stomach a short period after the same kinds of aliment had been eaten. The rapidity with which the substances were dissolved by the gastric fluid out of the body, was always in proportion to the purity of the fluid, and the tenderness of fibre and state of minute division of the substances submitted to its action. Milk and liquid albumen were found invariably to be first coagulated by the gastric fluid, and then dissolved. The solution of only a certain proportion of any given aliment was effected by a certain quantity of gastric juice. Thus it was found, in many experiments, that the articles submitted to the action of the fluid taken from the stomach became softened or dissolved to a certain extent, when all further change would cease; but when more gastric juice was added, the process of

solution would again commence. Cold gastric juice was found to be almost entirely inert. In one experiment, a piece of roasted beef was submitted to the action of the fluid placed in the open air at a temperature of 34° ; after twenty-four hours it was not in the least dissolved. The temperature of the fluid being now raised to 100° , the process of solution commenced and advanced regularly.

“A curious fact is shewn by the experiments of Dr. B.; that food, namely, taken from the stomach a short time after it has been eaten and thoroughly mixed with the gastric juice, will become completely dissolved, provided it be kept at a temperature of 100° .

“Dr. B. has found, that the gastric fluid undergoes little or no change when kept in vials for a length of time. On the 1st of November, 1833, he added to one ounce of the fluid taken from the stomach eleven months before, and which was as pure as when first extracted, thirty grains of lean mutton, boiled and masticated. The whole being placed in the axilla for six hours, sixteen grains of the meat became dissolved; the solution presenting the usual appearance of chyme.

“The period, as well as the quantity of gastric juice required for the solution of different alimentary substances out of the body varied, as we have already remarked, according to the density of their texture, and their state of division. Sago and tapioca, boiled, were dissolved completely in about three hours and 15 minutes; fresh wheat bread in 4 h. 30 min.; milk, boiled, in 4 h. 15 min.; unboiled, in 4 h. 45 min.; gelatine, boiled, in 4 h. 45 min.; hard-boiled eggs, in 8 h.; soft-boiled, in 6 h. 30 min.; oysters, raw and entire, in 7 h. 30 min.; stewed, in 8 h. 25 min.; beefsteak, in 8 h.; boiled beef, in 9 h. 30 min.; raw pork, in 8 h. 30 min.; fresh mutton, boiled, in 8 h. 30 min.; beef suet, boiled and entire, in 12 h.; mutton suet, boiled and divided, 10 h.; cream, 25 h. 30 min.; olive oil, 60 h.; apples, raw and entire, 18 h.; masticated, 8 h. 30 min.; turnips, boiled and entire, 13 h. 15 min.; raw, 18 h.; boiled potatoes, entire, 14 h.; mashed, 8 h. 30 min.; boiled parsnips, mashed, 6 h. 45 min.; entire, 13 h. 15 min.; raw and entire, 16 h.; raw cabbage, masticated, 12 h. 30 min.; boiled, 20 h.; mellow peach, cut small, 10 h.; mashed, 6 h. An entire portion of boiled tendon required 24 h. for its solution; when masticated, 12 h. 45 min.; a portion of boiled cartilage, divided, 12 h.; masticated, 10 h.; and a solid piece of bone, boiled, 80 h. In the above experiments the quantity of gastric juice employed was one ounce nearly to a drachm of the article submitted to its action.

“By the above statement it will be seen, that fat and oily food was among the articles which presented the greatest resistance to the solvent powers of the gastric fluid; this Dr. B. found to be invariably the case, as well in the stomach as out of it. Some of his experiments would seem to indicate, that the digestibility of this species of food, is facilitated by a slight admixture of bile with the gastric juice, and that, very generally, when aliment containing any quantity of fat is eaten, bile is very generally found in the cavity of the stomach.

“We felt extremely desirous of comparing the observations of our author in relation to the changes produced in the healthy process

of digestion, upon the different alimentary substances, with those of Tiedemann and Gmelin, by whom this subject has been examined with uncommon care and minuteness; but the want of precision in the description given of those changes by the former, and the entire absence of any thing like chemical analysis, prevent this from being done in a manner calculated to lead to satisfactory results. Taking, however, the articles albumen, gelatine, new cheese, and bone, we shall give first the observations of the German experimenters, and then subjoin those of Dr. Beaumont.

“Tiedemann and Gmelin found, that in the natural process of digestion, *liquid albumen* forms a homogeneous fluid, in which the albumen remains entirely unchanged; this species of chyme, they remark, passes the pylorus more rapidly than any other. *Coagulated albumen* they found to be much more slowly dissolved; the fluid formed possessing the properties of coagulated albumen dissolved in acetic acid.

“*Gelatine* they found to be converted into a clear brownish fluid, in which neither gelatine nor albumen could be discovered.

“*New cheese*, according to these gentlemen, forms an opaque, dirty white fluid, which contains much animal matter, which is neither casein, gelatine, nor albumen.

“*Bones*, in their experiments, formed a liquid, which contained not only animal matter, but also a large amount of lime.

“The following observations in regard to the changes produced in the same substances, are derived from the experiments of Dr. Beaumont, performed, in the majority of cases, with the gastric juice out of the body; with the general statement, that they resembled very nearly the changes which similar aliment was found to undergo when submitted to the natural actions of the stomach.

“When gastric juice and *liquid albumen* were mixed together, they were so much alike in their appearance at first, that no change was perceptible; but in ten or fifteen minutes, small, white flocculi began to appear, floating about, and the mixture became of an opaque whitish appearance. This appearance continued slowly and uniformly to increase for three hours, at which time the fluid had become of a milky appearance; the small flocculi had mostly disappeared, and a little light coloured sediment subsided to the bottom. No results are given of the action of the gastric fluid upon *coagulated albumen*.

“Eight ounces of calf’s-foot *jelly* alone were swallowed at one o’clock, P. M. The stomach being examined in twenty minutes, its contents were found to consist of gastric juice combined with the jelly, nearly all of which was in a fluid state; a few particles only of entire jelly were suspended in the fluid, with a few small, yellowish coagula floating near the surface. At two o’clock no appearance of jelly could be discovered. In another experiment, four ounces of pure *gelatine*, (*ichthyocolla*,) prepared with boiling water, were swallowed at forty-five minutes past eight o’clock, A. M. At the end of fifteen minutes the stomach appeared to be nearly as full as after an ordinary meal; it contained a clear fluid of the consistence of the white of an egg, composed apparently of the gelatine dissolved or diffused in the

gastric juice. The two could not, however, be distinguished from each other. After the lapse of forty-five minutes the stomach was found to be nearly empty, all that could be obtained from it being two drachms of a fluid, which appeared to be a mixture of gelatinous chyme, gastric juice, and mucous flocculi, more opaque and ropy than the gastric juice alone, and more acid than were the fluids of the stomach immediately before the gelatine was swallowed.

“Thirty grains of *new cheese*, masticated, were put in three drachms of gastric juice, and kept in the axilla for eight hours and thirty minutes, when the vessel was found to contain a rich milky fluid, on which floated five grains of a matter consisting principally of oil combined with a soft caseous substance. The fluid had a strong acid, or peculiar acrid taste, and emitted a strong caseous smell, even stronger than the cheese itself, before the experiment.

“*Bone*, after being dissolved in the gastric juice, formed a greyish-white opaque fluid, nearly of the colour and consistence of clear, thin gruel, with considerable fine brown sediment after standing at rest a while. It had a peculiar insipid, sweetish taste and smell, without the least fætor or rancidity.

“The solvent powers of the gastric fluid being established, an important inquiry next presents itself; upon what, namely, do those powers depend? In other words, does the gastric juice act upon the food by virtue of certain specific properties which distinguish it from all other chemical agents, or are its solvent powers to be attributed solely to the acids and salts which it contains? The first of these propositions is assumed by Dr. B.”

“‘The action of the stomach and its fluids on aliment is believed,’ he remarks, ‘to be *sui generis*, invariably the same in health on all kinds.’

“‘Chyme is a compound of gastric juice and aliment. It may be regarded as a *gastrite* of whatever it is combined with, varied according to the kind of aliment used.

“‘Like all other chemical agents, the gastric juice decomposes or dissolves, and combines with a fixed and definite quantity of matter when its action ceases.’”

“Without stopping to comment upon the absurd and inadmissible term *gastrite*, applied to the presumed chemical compound resulting from the union of definite proportions of gastric juice and the different alimentary substances, albumen, gelatine, fecula, and the like, we shall merely remark, that the specific and invariable character and action of the fluid secreted by the stomach are mere assumptions, which are disproved by the very analysis of the fluid, which shews it to be a *mixture* of mucus, water, and various salts and acids, the nature and chemical action of which are well understood. Not a single experiment is adduced by the author which would lead us even to suspect that the gastric juice possesses any solvent or chemical property other than those which result from the substances which are known to enter into its composition, or that these do not vary, in their relative proportions at least, at different times.

“If it can be shewn that other of the animal fluids, or even wa-

ter, with the addition of one or other of the active ingredients contained in the gastric juice, will cause a solution of alimentary substances, similar to that produced by the latter, the idea of any specific action being exerted by it is completely overthrown. As early as 1783, it was stated by Carminati, that he digested veal with a little salt, in pure water at 100° Fah., and that the veal became partially dissolved. He employed the decanted liquor in similar experiments, until at length he procured, as he asserts, a fluid possessed of solvent properties, similar to those of the gastric juice; and in 1788, Struve and Maquart made an artificial solvent of a weak solution of ammonia, which had the same properties, according to their statement, as the gastric juice. But passing over these experiments, which may be considered inconclusive, we find that Tiedemann and Gmelin in 1825, found that water slightly impregnated with acetic or hydrochloric acid, as well as a weak solution of either the acetate or hydrochlorate of ammonia severally dissolved, more or less of nearly all the animal substances employed as food. Several experiments were likewise performed by Dr. Beaumont, which prove the solvent action upon food of diluted acetic and hydrochloric acids. In one of these experiments, equal portions of beef-steak masticated, were immersed in gastric juice, and in an equal quantity of a mixture of muriatic and acetic acids, reduced by the addition of water to the flavour of the gastric fluid as nearly as practicable. Both were kept by means of a sand bath at the temperature of 100° Fah.; at the end of nine hours the meat in the gastric juice was all dissolved—that in the acid mixture when filtered, left a residuum weighing nine grains, of a gelatinous consistence. The solution in the gastric juice was opaque, and of a lightish grey colour, and deposited on standing a brown sediment. That in the acid mixture was also opaque, but of a reddish brown colour, and deposited no sediment.

“A similar experiment was repeated with pure dry gelatine. At the end of nine hours the gelatine in the gastric juice was entirely dissolved; that in the acid mixture when filtered, left a residuum of three grains of a gelatinous consistence. The solution in the gastric juice was opaque, and of a whitish colour, with a little fine brown sediment; that in the dilute acids was also opaque, but of a reddish brown colour, and of a thin, mucilaginous consistence, without any sediment. When an infusion of nut-galls was added to the first, it produced a rich cream-like fluid, and slowly precipitated a fine compact sediment; when added to the second, the whole formed immediately into a coarse brown coagulum. After standing a while, a large, loose, brownish sediment was precipitated, leaving a light coloured fluid, which became subsequently as white as milk, while the sediment became compact, and remained so.

“The same experiment with gelatine being repeated, at the end of five hours and a half, the portion in the gastric juice was all dissolved to a mere mite, that in the acid mixture nearly so, six grains only of a gelatinous consistence, remaining. The fluid in the first was of a blueish white colour; in the second, yellowish, or about the colour of dry gelatine. After remaining two hours and three quar-

ters longer, the gelatine in the dilute acid was entirely dissolved, and the fluids of both were nearly similar. The addition of an infusion of nut-galls formed in each, loose light coloured coagula. In the solution formed by the gastric juice, a compact sediment was thrown down, leaving an opaque milky fluid. In the solution formed by the acids, the coagula were not precipitated until after the lapse of forty-eight hours, forming then a compact mass with distinct particles of undissolved gelatine mixed with a dirty white-coloured, curd-like substance.

“Another experiment was performed with a mixture of hydrochloric and acetic acids, diluted with water to the flavour of gastric juice. In this was immersed a portion of broiled steak, cut fine, and the same amount of steak was immersed in an equal portion of gastric juice. In six hours and three quarters, the meat in the latter was nearly all dissolved; in eight hours longer, that in the acid mixture was dissolved with the exception of a very small jelly-like mass. The two liquids now resembled each other very nearly. That from the gastric juice being opaque and of a lightish-grey colour, with a dark brown sediment on standing; that from the acid mixture was also opaque, of a reddish brown colour, but without sediment. The addition of an infusion of galls caused in the first a fine reddish brown precipitate, leaving an opaque liquor of a similar colour; in the second, a more copious precipitate, leaving a clearer and thinner, almost transparent liquor, of a yellowish colour.

“It is well known that Montegre, in experiments performed with the saliva acidulated with vinegar, succeeded in dissolving various articles of food into a chymous pulp. Of the correctness of these experiments we have not the least doubt, having seen them repeated in this city with very similar results to those stated by Montegre, and having before us the additional testimony of a very late French experimenter,* who has shewn that the saliva, as well as the mucus of the intestines, obtained by opening the abdomen of an animal before eating, when slightly acidulated and kept at the temperature of the human body, will convert the food immersed in it for twenty-four or thirty-six hours into a greyish, perfectly homogenous paste. That the intestinal mucus will produce changes in food very analogous to those resulting from the action of the gastric juice, is attested also by Tiedemann and Gmelin, as well as by Leuret and Lassaigne. The following experiment was performed by Dr. Beaumont. Two equal portions of saliva were acidulated to about the flavour of gastric juice, the one with acetic, the other with muriatic acid, and in each were immersed two pieces of parsnip and two of carrot, the one boiled and the other raw, each weighing ten grains. The temperature of the fluids was kept at 100° Fahrenheit. After forty-eight hours, the parsnip in the saliva with muriatic acid had lost four grains, the carrot nothing; the parsnip in the saliva with acetic acid had lost six grains, and the carrot four; they appeared to have been rather

* Benjamin Voisin de la Digestion Considerée en Général. Paris, June, 1833.

macerated and diffused than dissolved or digested. The two fluids and their contents were now mixed together, and after twenty-four hours the whole remaining mass of vegetable matter weighed twelve grains. The fluid appeared now a little more chymous, and was rather turbid.

"It strikes us as not a little surprising that these experiments with artificial solvents did not suggest themselves to Dr. B. at a much earlier period than they were performed, (Feb. 1833,) and that when entered upon they were not more frequently repeated with different articles of food and with acid mixtures of various strength. Incomplete as they are, they, however, prove that as far as it regards its solvent properties, at least, the gastric fluid is not *sui generis*."

"It will not do to say that the product of these artificial solutions is not identical with that resulting from the action of the gastric juice. This must be proved by a chemical analysis of the two. But even if they should be shown in this manner to differ materially, it is to be recollected that the gastric juice contains chemical agents independently of its acids, all of which are doubtless necessary in causing the solution of the different kinds of food, or perhaps of its different nutritive principles."

"Dr. Beaumont has proved with great clearness, that the gastric juice does not accumulate in the stomach in the intervals of digestion, as many physiologists, and Spallanzani among the number, have supposed; but is secreted only when food is admitted into the gastric cavity, or some other stimulus is applied directly to its lining membrane. This fact was pointed out long since by Chaussier, and more recently by the experiments of Tiedemann and Gmelin, and those of Leuret and Lassaigne."

"When it does not contain food, Dr. B. has usually observed the stomach to be empty and contracted, the rugæ formed by its inner coats being irregularly folded upon each other, and almost in a quiescent state. The whole of the mucous membrane of the stomach when perfectly free from disease, is of a light or pale pink colour, of a soft velvet-like appearance, and covered constantly with a very thin transparent viscid mucus."

"Immediately beneath the *mucous coat* (?) and apparently incorporated with the villous membrane, appear small, spheroidal, or oval-shaped, glandular bodies, from which the mucus fluid appears to be secreted."

"If the mucus covering the inner coat of the stomach be wiped off with a sponge during the period of chymification, the mucous membrane appears roughish, and at first, of a deep pink colour, but in a few seconds the follicles and fine papillæ begin to pour out their respective fluids, which being diffused over the parts from which the mucus had been removed, restore to them their peculiar soft, velvet-like appearance and pale pink colour, and the gastric juice begins to trickle down the sides of the stomach. When the mucus is wiped off during the period the stomach is empty, a similar roughness and deepened colour are produced, though in a less degree. The folli-

cles appear to swell more gradually, and the fluids are not secreted in sufficient quantity to trickle down, as during the period of chymification.

“ When the tongue is applied to the mucous coat of the stomach in the empty, unirritated state of the organ, no acid taste is perceptible, but whenever food or any other irritant is applied to the membrane so as to excite the gastric papillæ, an acid taste is immediately perceptible.

“ The ordinary temperature of the interior of the stomach during health, Dr. B. has ascertained to be about 100° Fahr. as well in the intervals as during the process of digestion. There would appear, however, to be some difference in the temperature of different regions of the organ, it being somewhat higher at the pyloric than at the cardiac extremity. Variations in the state of the atmosphere were found in some of Dr. B.’s experiments, to affect the temperature of the stomach; a dry state of the atmosphere increasing, and a humid one diminishing it. Active exercise also was found to elevate invariably the temperature of the stomach, under all circumstances, about one and a half degrees.

“ When a portion of food is received into the stomach, the action of the vessels of its mucous coat becomes increased, the latter acquires a brighter red colour, the vermicular motions of the organ are excited, and the secretion of the gastric juice commences.

“ The latter appears to issue ‘ from innumerable vessels, distinct and separate from the mucous follicles. These vessels when examined with a microscope, appear in the shape of small lucid points, or very fine papillæ, situated in the interstices of the follicles.’ The gastric fluid, according to the observations of the author, is secreted in quantities exactly proportioned to the amount, and greater or less degree of solubility of the food admitted into the stomach, excepting when more is eaten than is necessary for the wants of the system. The fluid is either absorbed by the portion of aliment in contact with the coats of the organ, or collects in small drops, and trickles down the sides of the stomach, to the more depending parts, and there mingles with the food or whatever else the stomach contains.”

“ ‘ In febrile diathesis, or predisposition from whatever cause—obstructed perspiration, undue excitement by stimulating liquors, overloading the stomach with food—fear, anger, or whatever depresses or disturbs the nervous system, the villous coat becomes sometimes red and dry, at other times pale and moist, and loses its smooth and healthy appearance—the secretions become vitiated, greatly diminished, or entirely suppressed—the mucous coat (?) scarcely perceptible, the follicles flat and flaccid, with secretions insufficient to protect the vascular and nervous papillæ from irritation.

“ ‘ There are sometimes found on the internal coat of the stomach, eruptions or deep red pimples, not numerous, but distributed here and there upon the villous membrane, rising above the surface of the mucous coat. (?) These are at first sharp-pointed and red, but frequently become filled with white purulent matter. At other times

irregular, circumscribed, red patches, varying in size or extent, from half an inch to an inch and a half in circumference, are found on the internal coat. These appear to be the effect of congestion in the minute blood-vessels of the stomach. There are also seen at times, small aphthous crusts in connexion with these red patches. Abrasions of the lining membrane, like the rolling up of the mucous coat (?) into small shreds or strings, leaving the papillæ bare, for an indefinite space, is not an uncommon appearance.

“These diseased appearances, when very slight, do not always affect essentially the gastric apparatus; (?) when considerable, and particularly when there are corresponding symptoms of disease, as dryness of the mouth, thirst, accelerated pulse, &c., no gastric juice can be extracted, not even on the application of alimentary stimulus. Drinks received are immediately absorbed, or otherwise disposed of; none remaining in the stomach ten minutes after being swallowed. Food taken in this condition of the stomach, remains undigested for 24 or 48 hours, or more, increasing the derangement of the whole alimentary canal, and aggravating the general symptom of disease.”

“Dr. B. has observed that when a portion of food is received into the stomach, the rugæ of the latter gently close upon it, and, if sufficiently fluid, gradually diffuse it through the cavity of the organ, entirely excluding more during this action. The contraction ceasing, another quantity of food will be received in the same manner. It was found that when the valvular portion of the stomach in the subject of his experiments was depressed, and solid food introduced, either in entire pieces or finely divided, the same gentle contraction or grasping motion took place, and continued for fifty or eighty seconds, and would not allow of the introduction of another quantity until that period had elapsed, when the valve could be again depressed and more food put in. When the subject was so placed that the cardia could be seen, and then allowed to swallow a mouthful of food, the same contraction of the stomach and grasping of the bolus was invariably observed to commence at the œsophageal ring. Hence, when food is swallowed too rapidly, irregular contractions of the muscular fibres of the œsophagus and stomach are produced, the vermicular motions of the rugæ are disturbed, and the regular process of digestion is interrupted.

“Contrary to the opinions of many physiologists, Dr. B. has ascertained that the solution of the food commences immediately after it is received into the stomach. Water, alcohol, and other fluids not containing alimentary matter in solution, pass from the stomach very soon after they are received, either by absorption or through the pylorus. Liquid albumen and albuminous fluids are first coagulated, and then dissolved by the gastric juice. Food taken in a liquid form combined with a large quantity of water, as soup, &c. is deprived by absorption of its aqueous portion before its digestion is commenced.

“According to Dr. Wilson Philip, and the fact is confirmed by the experiments of Brodie, Broughton, Breschet, Edwards, and others, the digestion of the food commences first in the portion imme-

diately in contact with the surface of the stomach, and as the thin layer of chyme there formed is removed by the muscular action of the organ, a second layer is chymified—digestion always commencing on the surface of the food. In reference to this opinion, Dr. Beaumont remarks:—

“ ‘ That chymification commences on the surface of the food I have no doubt; but I apprehend this to be the case as it respects each individual portion, and not the whole mass.

“ ‘ When a due and moderate supply of food has been received, it is probable that the whole quantity of gastric juice for its complete solution, is secreted, and mixed with it in a short time. If a tenacious mass of food be used, the external portion of the whole quantity is first acted on, digested, and succeeding portions presented, &c. From numerous examinations of the stomach, I feel warranted in saying, at least in the human subject, that there is a perfect admixture of gastric juice and food—that the particles of food are constantly changing their relations with each other.’ ”

“ We would inquire, however, of Dr. Beaumont, whether he has ascertained positively that contact of the food with the coats of the stomach is not essential to its perfect digestion? The whole mass of food contained in the stomach may be pervaded by the gastric juice and solution go on equally in every part of it, but the question is does a single particle become converted into perfect chyme that has not come in contact with the parietes of the digestive organ, so as to enable the absorbents of the latter to act upon it? From a careful consideration of all the phenomena of digestion, we feel no hesitation in asserting as our opinion, that chymification, strictly speaking, invariably takes place in that portion of the aliment which is applied to the inner surface of the stomach, and that it can take place no where else. It will not do for Dr. B. to reply that he has produced chyme by the action of the gastric juice on aliment out of the stomach, he must first show by a chemical analysis that the fully formed chyme as it passes into the duodenum, and the food after its solution, merely, by the gastric juice, are identically the same—and this he has not even attempted to do. That the absorbents of the stomach do act upon the aliment is proved by the fact, that a chylous fluid is formed by these vessels as well as by those of the intestines. This is shewn by the experiments of Leuret and Lassaigne, and more recently by those of Voisin.

“ Dr. Beaumont having observed a large portion of fluid in the stomach, even after a dry and solid meal had been eaten, presumes that a synthetic formation of water from its elements takes place in that organ. We need only remark that the supposition is in the highest degree improbable; whatever amount of fluid may be poured into the stomach during digestion, we have no right to refer it to any other source than the exhalants of the mucous membrane.

“ The stomach is not quiescent during the process of chymification. By the alternate contraction and relaxation of its transverse muscular fibres a peristaltic motion is produced, which commences

soon after the food is received, and causes the latter to revolve around the interior of the gastric cavity, from point to point and from one extremity to another."

" 'The ordinary course and direction of the revolutions of the food,' according to our author's observations, 'are first, after passing the œsophageal ring, from right to left, along the small arch; thence, through the large curvature, from left to right. The bolus as it enters the cardia turns to the left, descends into the splenic extremity, and follows the great curvature towards the pyloric end. It then returns, in the course of the smaller curvature, to perform similar revolutions.' "

"These revolutions are completed in from one to three minutes. They are, however, slower at first than after chymification has considerably advanced.

"The motions of the stomach not only produce the revolutions of the food just referred to, but, by a kind of agitation or *churning* of the contents of the organ, cause the particles of the aliment to be separated from each other and intimately mixed with the gastric fluids."

" 'There is nothing,' remarks Dr. B. 'of the distinct lines of separation between the old and new food, and a peculiar central or peripheral situation of crude as distinguished from chymified aliment, said to have been observed by Philip, Magendie, and others in their experiments on dogs and rabbits, to be seen in the human stomach; at least in that of the subject of these experiments. The whole contents of the stomach, until chymification be nearly complete, exhibit a heterogeneous mass of solids and fluids; hard and soft, coarse and fine, crude and chymified; all intimately mixed, and circulating promiscuously through the gastric cavity, like the mixed contents of a closed vessel, gently agitated or turned in the hand.' "

"We suspect, however, that this commixture of the different contents of the stomach, noticed in the experiments of our author, must, in some measure, have been owing to the manner in which he extracted them for examination; namely, 'by depressing the valve within the aperture, shaking a little, and pressing upwards.' The firm compression which the stomach exerts upon its contents, would, of itself, be sufficient to force the more fluid portions to the surface, and unless some such separation does take place we cannot conceive how the digested food is carried off, by the muscular actions of the stomach, through the pylorus, while that which has not undergone the process of chymification is retained. On two occasions Dr. B. would seem to admit, that the digested and undigested portions of the aliment occupy different portions of the gastric cavity. Thus, at page 142:—

" 'It is possible,' he remarks, 'that the portion (of aliment) presented at the perforation, may be in a more advanced stage of digestion than the rest of the mass, and consequently lighter, and float on

the surface of the more solid portions of food. In ordinary cases such would be found to be the case.’”

“ And again, at page 144:—

“ ‘ It may be inferred from this experiment, (the 26th,) that the more perfectly chymified portions of food rise to the superior part of the stomach, as suggested in a preceding observation, and are consequently exposed at the perforation, from whence parcels are taken for experiment and examination.’ ”

“ According to Dr. Wilson Philip’s observations, when food has been taken at different times, the new is never mixed with the old. Dr. Beaumont, however, conceives that this statement is not correct, but that in a very short time the food already in the stomach and that subsequently eaten become combined.”

“ ‘ One thing,’ he remarks, ‘ is certain, and it is capable of demonstration in the stomach of the subject of these experiments, that old and new food, if they are in the same state of comminution, are readily and speedily mixed in the stomach.’ ”

“ The ordinary time required for the complete digestion of the food received into the stomach, during a healthy state of the organ, Dr. B. has ascertained to be about three hours and a half. The facility of digestion is modified, however, by many circumstances, as idiosyncrasies, habit, the nature of the food and the manner in which it is prepared. Minuteness of division of the aliment and tenderness of its fibre, would appear to be the two great essentials for its speedy and easy digestion.”

“ ‘ Albumen, if taken into the stomach, either very slightly or not at all coagulated, is perhaps as rapidly chymified as any article of diet we possess. If perfectly formed into hard coagula by heat or otherwise, and swallowed in large solid pieces, it experiences a very protracted digestion. Fibrine and gelatine are affected in the same way. If tender and finely divided, they are disposed of readily; if in large and solid masses, digestion is proportionably retarded.’ ”

“ Animal fat is very quickly and invariably rendered fluid by the heat of the stomach, and, together with every species of oily food, resists for a long time the action of the digestive organ and its fluids. Dr. B. has observed that when the use of fat or oily food has been persevered in for a long time, there very generally takes place an admixture of bile with the gastric fluids, and from numerous experiments he has been led to believe that this admixture of bile has the effect of facilitating the solution of such kinds of aliment.”

“ ‘ Bulk is, perhaps, nearly as necessary to the articles of diet as the nutrient principle. They should be so managed that one should be in proportion to the other. Too highly nutritive diet is probably as fatal to the prolongation of life and health, as that which contains an insufficient quantity of nutriment.’ ”

“ Solid aliment Dr. B. has observed to be sooner disposed of by

the stomach than fluid; he conceives, also, that its nutritive principles are sooner carried into the circulation. The correctness of the latter proposition is however very doubtful; the very fact admitted by the author, that exhaustion from abstinence, namely, is more quickly removed by liquid than by solid food, would certainly seem to disprove it.

“An incipient state of putrefaction, sufficient to render the muscular fibre slightly tender, was found to increase the digestibility of most kinds of flesh.

“Vegetable aliment, generally speaking, he discovered to be slower and more difficult of digestion than animal. Its solution in the stomach is greatly influenced, however, by division and tenderness of fibre. Crude vegetables often pass through the pylorus in an undigested state, while other food is retained and fully digested.

“The thorough mastication of the food is essential to healthy digestion.”

“‘If aliment,’ remarks the author, ‘in large masses be introduced into the stomach, though the gastric juice may act upon its surface, chymification will proceed so slowly, that other changes will be likely to commence in its substance before it will become completely dissolved. Besides, the stomach will not retain undigested masses for a long time without suffering great disturbance.’”

“Consequently eating too fast impedes digestion, by introducing food into the stomach in a state unprepared for the actions of that organ and of its fluids. If food, also, be swallowed too rapidly more will in general be taken into the stomach, before the sense of hunger is allayed, than can be digested with ease.

“Overloading the stomach with aliment was invariably found to interfere with the regular process of chymification; a portion remaining for a long time undigested. This very soon becomes rancid, or runs into acetous fermentation, and if not rejected by vomiting, causes pain and irritation of the stomach and other distressing symptoms; or it is permitted to pass into the intestines, where its presence almost invariably gives rise to colic, flatulence, or even more dangerous affections.

“The reason why too large an amount of food is injurious, is supposed by our author to be, because ‘the quantity of gastric juice, either contained in its proper vessels, or in a state of preparation in the circulating fluids, is believed to be in *exact proportion* to the proper quantity of aliment required for the due supply of the system.’ Hence, if more food than is necessary be taken, a part of it must consequently remain undigested. We have no evidence, however, that the solvent fluid secreted by the stomach is furnished only in a certain amount; it appears to us more probable, that when too large a quantity of food is eaten, it causes an undue distention of the stomach, and in this manner prevents its regular and healthy actions from going on; while, at the same time, most generally the food is swallowed faster than the gastric juice is secreted, and in a state unfitted to be acted upon by it.

“Condiments, according to our author, though they may at first excite the action of a debilitated stomach, yet when used habitually, never fail to produce indirect debility of that organ, and in this manner impede digestion.”

“Salt and vinegar are exceptions, and are not obnoxious to this charge when used in moderation. They both assist digestion—vinegar, by rendering muscular fibre more tender—and both, by producing *a fluid having some analogy to the gastric juice.*”

“Alcoholic, and Dr. B. thinks probably all artificial drinks, impede more or less the digestive process; some more so than others; but none can claim exemption from the general charge. Even coffee and tea, the common beverages of all classes of people, have a tendency to debilitate the digestive organs.’ In the correctness of these opinions we most heartily and fully concur.

“Our author has found, from numerous trials, that moderate exercise, so far from interrupting digestion, conduces greatly to its healthy and rapid performance. Severe and fatiguing exercise, however, always retards digestion.

“It is stated by most physiologists, that during digestion the stomach becomes a centre of fluxion; but against the use of such an expression Dr. Beaumont strongly objects; it being one, as he declares, to which no definite meaning can be attached. We confess that we were somewhat surprised at this assertion; we have repeatedly employed the same expression ourselves, and really did believe that we were conveying to all our readers who were any way conversant with medical language a definite idea; namely, that more blood is determined to the stomach during the period of digestion than when the functions of that organ are not in exercise.* That the stomach really does become a centre of fluxion when digestion is going on, is proved by the observations which Dr. B. has himself recorded. He tells us that, during digestion, the action of the vessels of the mucous membrane is increased, that the colour of the latter is of a brighter red, and that a very copious secretion takes place from its follicles and papillæ—that all this is occasioned by an irritation of the membrane resulting from the presence of the food; and further, that gentle exercise increases the circulation in the vessels of the stomach and the temperature of the latter, and in this manner facilitates digestion.

“As the food becomes more and more changed from its crude to its chymified state, the acidity of the gastric fluids is considerably increased; more so in vegetable than *in* animal diet; and the general contractile force of the muscles of the stomach is augmented in

* We entirely agree with the transatlantic reviewer in the above remarks. We wonder, indeed, how any accurate observer could doubt the fact that, during digestion, the vital powers, as well as the vital fluids, are concentrated on the digestive apparatus. Let any one carefully attend to his own feelings, and to the phenomena presented in his own person, and he will soon be convinced of the truth of these observations.—*Editors of the Medico-Chirurgical Review.*

every direction ; giving the contained fluids an impulse towards the pylorus."

"It is probable that from the very commencement of chymification—from the time that food is received into the stomach, until that organ becomes empty, portions of chyme are constantly passing into the duodenum, through the pyloric orifice, as the mass is presented at each successive revolution. I infer this from the fact, that the volume is constantly decreasing. This decrease of volume, however, is slow at first; but is rapidly accelerated towards the conclusion of digestion, when the whole mass becomes more or less chymified. This accelerated expulsion appears to be affected by a peculiar action of the transverse muscles, or rather of the *transverse band*, as described by Spallanzani, Haller, Cooper, Sir E. Home, and others, in their experiments on animals. This band is situated near the commencement of the more conical shaped part of the pyloric extremity, three or four inches from the smaller end. In attempting to pass a long glass thermometer tube through the aperture, into the pyloric portion of the stomach, during the latter stages of digestion, a forcible contraction is first perceived at this point, and the bulb is stopped. In a short time there is a gentle relaxation, when the bulb passes without difficulty, and appears to be drawn forcibly, for three or four inches, towards the pyloric end. It is then released, and forced back, or suffered to rise again; at the same time giving to the tube a circular, or rather spiral motion, and frequently revolving it completely over. These motions are distinctly indicated, and strongly felt, in holding the end of the tube between the thumb and finger; and it requires a pretty forcible grasp to prevent it from slipping from the hand, and being drawn suddenly down to the pyloric extremity. When the tube is left to its own direction, at these periods of contraction, it is drawn in nearly its whole length, to the depth of ten inches; and when drawn back, requires considerable force, and gives to the fingers the sensation of a strong *suction* power, like drawing the piston from an exhausted tube. This ceases as soon as the relaxation occurs, and the tube rises again of its own accord three or four inches, when the bulb seems to be obstructed from rising further; but if pulled up an inch or two through the structure, it moves freely in all directions in the cardiac portions, and mostly inclines to the splenic extremity, though not disposed to make its exit at the aperture. Above the contracting band, and towards the splenic portion of the stomach, the suction or grasping motion is not perceptible, but when the bulb is pushed down to this point, it is distinctly felt to be grasped, and confined in its movements. These peculiar motions and contractions continue until the stomach is perfectly empty, and not a particle of food or chyme remains, when all becomes quiescent again.

"If the bulb of the thermometer be suffered to be drawn down to the pyloric extremity, and detained there for a short time, or if the experiment be too frequently repeated, it causes severe distress, and a sensation like cramp or spasm, which ceases on withdrawing the tube, but leaves a sense of soreness and tenderness at the pit of the stomach.

“ ‘ These peculiar contractions and relaxations succeed each other at irregular intervals, of from two to four or five minutes. Simultaneously with the contractions, there is a general shortening of the fibres of the stomach. This organ contracts upon itself in every direction, and its contents are compressed with great force. During the intervals of relaxation, the rugæ perform their vermicular motions, and the undulatory motions of the fluids continue.’ ”

“ From the foregoing facts, Dr. B. draws the following conclusions: namely, that—

“ ‘ The longitudinal muscles of the whole stomach, with the assistance of the transverse ones of the splenic and central portions, carry the contents into the pyloric extremity. The circular or transverse muscles contract progressively from left to right. When the impulse arrives at the *transverse band*, this is excited to a more forcible contraction, and closing upon the alimentary matter and fluids contained in the pyloric end, prevents their regurgitation. The muscles of the pyloric end now contracting upon the contents deposited there, separate and expel some portion of the chyme. After the contractile impulse is carried to the pyloric extremity, the circular band and all the transverse muscles become relaxed, and a contraction commences in a reversed direction from right to left, and carries the remaining contents again to the splenic extremity, to undergo similar revolutions.

“ ‘ After the expulsion of the last particles of chyme, the stomach becomes quiescent, and no more (gastric) juice is secreted, until a fresh supply of food is presented for its action, or some other mechanical irritation is applied to the internal coat (of the organ.)’ ”

An Essay on the Tuberculous Diseases of the Bronchial Glands.—Prize Essay. By J. M. BERTON.

THIS essay forms a portion of one on phthisis, which the author has appended to an edition of Professor Chomel's Lectures on Typhoid Fever. As it treats of a subject of great importance, and one but little studied in this country, we have determined on giving it in full to our readers.

“ The bronchial glands are situated around the bronchi, and extend from the bifurcation of the trachea into the very tissue of the lungs, where they bury themselves, their volume gradually decreasing. Their number varies, but is always considerable. The opinions of Senac and Portal on the structure and particular function of these bodies, is now but little attended to, and it is generally admitted, that Haller was right in considering that a perfect analogy existed between these ganglia and the other lymphatic glands. The latter present many distinctions in regard to colour, according as they are met with in different tissues, but there is this peculiarity in the

bronchial glands of man, and many domestic animals, namely, that they vary in colour in various stages of life ; thus, in childhood they are red, in youth brown, and in the adult and the old become black, from the presence of carbon. They are also provided with a membranous cyst, their form is oval, and their tissue soft. In fine, these glandular bodies receive, like the other glands, lymphatic vessels, viz., those of the lung and bronchi directly, and those of the pleura, pericardium, heart, and thoracic parietes, by anastomoses.

“ The bronchial glands may be affected by morbid causes acting on the system to which they belong, or on the organs whose functions they are allied with.

“ According to Laennec, inflammation of these glands is rare ; a proposition which may be true relatively but not absolutely. In fact, we very rarely find with adults who have had prolonged attacks of bronchitis or pneumonia, that there has appeared any appreciable change in the state of these glands. The case is different in children, for with them the bronchial glands generally inflame when an irritating cause has acted on an organ of the chest from which lymphatic vessels issue, having a relation of function with those glands.

“ This inflammation is commonly slow, chronic, and latent. Under its influence the ganglionic tissue becomes more firm and redder ; the gland swells and sometimes acquires a considerable bulk. The superficial lymphatic glands, when under chronic inflammation, become swollen and shining, and are painful on pressure. The situation of the bronchial glands does not admit of our proving the analogous existence of this latter phenomenon.

“ Chronic inflammations, and more particularly those of glandular tissues, seem not to be liable to terminate by suppuration. Suppuration of the bronchial glands is also a very rare consequence of their inflammations. I have never met with true abscess of these glands, and Laennec says that he has met with *but a very small number of them*.

“ Tuberculous degeneration of the bronchial glands is much more frequently the result of acute inflammation.

“ Bronchial phthisis is a disease which appears to be almost peculiar to infancy. It is also very common in the age between the two dentitions, and makes the greatest havoc among children whose constitution is characterized by a predominance of the lymphatic system.

“ All causes likely to develop an irritability of the lymphatic glands in general, and of the bronchial and pulmonary ganglia in particular, dispose the latter to inflammation and the development of tubercles. Such is the cause of the development of what is termed scrofulous diathesis, such is that under the influence of which bronchial and pulmonary inflammations, &c. &c. display themselves. In contrasting the effects of pure country air, with those produced from breathing the infectious air of hospitals, we shall find, that tuberculous affections prevail in the latter, so as to be in a manner endemic. Thus, children living in towns, or confined and badly ventilated situations, and inhabiting cold and damp dwellings, are most subject to bronchial phthisis.

"We find, that the lymphatic glands of the neck become painful, swollen, tuberculous, &c. (ganglione tuberculeuse,) from inflammation of the gums in dentition, from ophthalmia, from affections of the scalp, &c., and that in young subjects the mesenteric glands become red, tumid, and impregnated with tuberculous matter, in consequence of inflammatory affections of the bowels; in like manner in children the bronchial glands inflame, and are transformed into tubercles after prolonged pneumonia or bronchitis.

"This greater susceptibility of the lymphatic glands in general, and of the bronchial glands in particular, at the first epochs of life, may be explained by the greater activity of the lymphatic system at those periods. In childhood, this system appears, in fact, to be the principal agent of intestinal absorption, a function which in manhood and old age seems to belong to the venous system. The pre-existence of inflammation to the tuberculous transformation of the lymphatic glands, has been already recognized and published; the inflammatory origin of a similar transformation appears above all, evident in bronchial phthisis.

"The study of the lesions of the bronchial glands affords proof of the existence of a successive and intimate relation between the acute inflammatory state of these organs, and their tuberculous state. By comparing our clinical experience with the results offered by *post mortem* examinations, we have found, that certain symptoms always indicate certain corresponding pathological characters. According to the duration of the disease, the periods being relatively as one, two, three, there was observed one of the following changes; 1st, the organ was found to be of a livelier colour, shining, and hypertrophied; 2nd, the preceding characters joined to the presence of tuberculous matter; 3rd, absence of all trace of ganglionic tissue, which was everywhere replaced by tuberculous matter. Thus, it was most commonly in children who had coughed for about one or two months, that I found the bronchial glands merely inflamed; it was after two, three, or four months' cough, that these glands appeared inflamed and tuberculous; and it was after four, five, or six months, that I found nothing but tubercles in place of them. These results have been arrived at from 180 observations.

"The examination of the bronchial glands, partly inflamed, and partly tuberculous, is very interesting. It is under such circumstances, that we may as it were, seize upon the cause producing the effect, and observe the inflammatory process degenerating into tubercle. At such a period we see evident traces of inflammation, and of productions of tuberculous matter in divers states of combination. Sometimes the tuberculous matter is found occupying the place of a third or a half of the gland; and sometimes there remains but the cyst of the latter, or some vestige of it, the tuberculous matter having taken the place of the gland. Wherever this accidental tissue has formed, the ganglionic tissue has disappeared, and the few traces of it that may remain, form a contrast by their colour with the pale substance to which they are united. A well marked line does not always separate distinctly the inflamed part

from that which has undergone the tuberculous alteration: but we often find near the common limit a sort of fusion of the two substances, owing probably to the degeneration about to take place in that point of the glandular tissue.

“Judging then by what is observed in similar circumstances, and rejecting the opinions of those authors who deny the influence of inflammation in the production of tubercles, and who look on these bodies only as an accidental tissue, *sui generis*, springing up and developing itself *capriciously*, if we may use the word, in the centre of organs, should we not be induced to attribute the *matter of tubercle* to the result of a transformation, or particular organic degeneration, the consequence of inflammation? A theory the more to be allowed as, now-a-days, many pathologists attribute a similar origin to the scirrhus tissue, which, for the most part, presents no visible traces of organization, and which it was customary to arrange under the head of *accidental non-analogous tissues*.

“What has been said of the tuberculous change of the bronchial glands, is applicable to a similar alteration of the lymphatic glands of the mesentery,—of the neck, &c. &c., and the following list of a certain number of facts, would incline us to believe that inflammation is the cause of the production not only of bronchial, but of pulmonary tubercles:

The bronchial glands were red, developed, &c. at the same time that there existed traces of	$\left\{ \begin{array}{l} \text{Pneumonia} \\ \text{Bronchitis} \\ \text{Pleurisy} \\ \text{Phthisis} \end{array} \right\}$	among	$\left\{ \begin{array}{l} 18 \text{ subjects.} \\ 10 \text{ do.} \\ 2 \text{ do.} \\ 2 \text{ do.} \end{array} \right\}$
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The tissue of these glands was partly inflamed and partly replaced by tuberculous matter, at the same time that there existed traces of	$\left\{ \begin{array}{l} \text{Pneumonia} \\ \text{Bronchitis} \\ \text{Pleurisy} \\ \text{Phthisis} \end{array} \right\}$	among	$\left\{ \begin{array}{l} 8 \text{ subjects.} \\ 5 \text{ do.} \\ 2 \text{ do.} \\ 4 \text{ do.} \end{array} \right\}$
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These glands, entirely tuberculous, were accompanied by traces of	$\left\{ \begin{array}{l} \text{Pneumonia} \\ \text{Bronchitis} \\ \text{Pleurisy} \\ \text{Phthisis} \end{array} \right\}$	among	$\left\{ \begin{array}{l} 6 \text{ subjects.} \\ 5 \text{ do.} \\ 0 \text{ do.} \\ 25 \text{ do.} \end{array} \right\}$
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To each of these three series we must attach the idea of a different duration of the diseases which have given rise to each alteration. Thus, as has been already proved, the mean duration should be considered as one or two months, for the affections arranged in the first series; and at three, four, or six months, for those placed in the second and last. In this table it is easy to observe that the inflammations of the lung and bronchi (without the complication of pulmonary tubercles) prevail in the first of the three groups that compose it; that at a later period (second series) these inflammations diminish in a certain proportion, while pulmonary tubercles become more frequent: finally, that at a still more remote period (third series) pulmonary phthisis is the most common affection. I shall observe besides, that, with the exception of eight, all the individuals

in whom there existed bronchial and pulmonary tubercles at the same time, had presented on dissection evidence of inflammation of the lung, the bronchi, or the pleura; that the most of them during life had been disposed to catarrhs; that all without exception had had cough during their last illness; and, it is beyond a doubt, even from Laennec himself, that bronchitis may exist without leaving any traces after it.

“It has been said that pulmonary tubercles have been met with in individuals who had *never* had bronchitis, pneumonia, &c., and who had never even coughed! But we may affirm, that in those cases of pulmonary tubercles, not preceded by hæmoptysis, nor by symptoms of inflammation of the respiratory organs, there may have existed a previous state of inflammation or congestion, consisting of *partial lobular pneumonia*, which gave rise only to symptoms of a very slight bronchitis, or to no symptom whatever! a circumstance observed by MM. Andral and Frank.

“However, laying aside a circumstance that occurs very frequently, namely, that the inflammation of a viscus or its appendices may have preceded inflammation of the lymphatic glands associated from their functions with that viscus; the irritability of the lymphatic system in general, and of the lymphatic glands in particular, being augmented by a primitive essential property (scrofulo-lymphatic temperament;) we find that in consequence of this increase of irritability, inflammation, and tuberculization of these glands may occur; and thus we may conceive how, by a sort of *extension of the scrofulous disease*, pulmonary tubercles may be developed in individuals who have been at all times exempt from pulmonary inflammations, and who, in fact, have never coughed.

“Anatomy, it is true, has not revealed the existence of lymphatic glands in the substance of the pulmonary tissue. We are acquainted with the glands surrounding the bronchi, even to their entrance into the lungs, but from their continually decreasing in size we soon lose sight of them. Might not the lymphatic glands escape our observation in like manner from their extreme tenuity. I should be much inclined to believe that the granulations described by Bayle, are those very glands swollen, hypertrophied, or having undergone some morbid change.

“These granulations examined with a magnifying glass, appear under the form of small round semitransparent bodies, of a greyish colour, of the size of a grain of millet or hemp seed; they are surrounded by a membrane, on the surface of which may be traced some vessels. The presence of these bodies is allied to the existence of scrofulous affections, properly so called, and, like the latter, are observed but little in children before the first dentition, and are rarely met with in adults or old persons. Like the lymphatic glands, these granulations are transformed into tubercles, and this degeneration begins often most in the centre. Besides it is only in certain cases that these glands acquire from inflammation that volume which characterises them as granulations. It would appear that they are changed into tubercles according as inflammation shall have reached them,

without having acquired before-hand any certain degree of hypertrophy. This will explain how it happens that we sometimes meet very small tubercles in a lung, without finding any granulations in it.

“What are the symptoms of bronchial phthisis? If in reply to this question we consulted only our imagination, or ideas already sent forth to the world, and recalled to memory the seat which the bronchial ganglions occupy, the parts with which they are surrounded, and the enormous volume which these glands sometimes acquire, the idea of compression would not fail to present itself to the mind. What a number of remarkable phenomena might not this imaginary cause give rise to! In fact, I had figured to myself that the bronchial ganglia and the different lymphatic glands of the thorax, ought, in certain cases of tuberculous development, to compress some large vessels near their origin; that from this impediment offered to the course of the blood should spring up dilations, hypertrophies of the centre of the circulation, &c. &c. I acknowledge that a superficial examination, joined with preconceived ideas, would have led me into error,—but here are facts:

“OBSERVATION I.—A child entered the hospital in June, 1826. His face was pale and swollen; the limbs anasarcaous; the head scabby; the glands of the neck engorged. He was a long time sick, and had a cough for several months; respiration impeded and abdominal; great oppression; sonorous rale at both sides of the chest; beating of the heart strong, and extending over a large space; heat of skin natural; pulse regular, and seventy-six a minute: such were the most prominent symptoms. The child died before the end of three months from admission.

“On examination after death several ounces of a transparent yellow serum were found in the pleural sacs. The internal surface of the larynx and trachea was injected; the colouring did not enter the bronchial ramifications, but the latter were smeared with puriform mucus. The three lobes of the right lung were adherent together; the middle lobe alone towards its posterior part was hepatized. The two left lobes were attached together by old adhesions. The lymphatic glands situated on the sides of the neck and wind-pipe were developed, and were partly red and tuberculous; the inter-bronchial glands were of great size and entirely tuberculous. The heart was twice the size of the child's hand when closed, its cavities full of clots of black blood. Voluminous tubercles surrounded the origin of the large vessels; others in great number were between the trunk of the *innominata* and the *vena cava*; yet no real compression resulted.

“OBSERVATION II.—Herpin, æt. 9 years. This little girl was pale, fair, weakly; she had scabs on the head, and swollen glands in the neck; she had cough for twelve months, and had lost flesh for four months before admission.

“Skin cold; cough frequent; no sleep; beating of the heart, tumultuous and extended; pain in the precordial region; pulse small, frequent, and irregular; extremities cold; lips livid; oppression. The

chest was sonorous, but exhibited no pulmonary expansion at the right side. She died the day of her admission to hospital.

“*Autopsy*.—Volume of the heart very great (twice the size of the child’s hands;) dilatation of the left cavities of this organ. The glands about and between the bronchi voluminous and tuberculous, but not compressing any vessel.

“It would be useless to cite at length other observations in which the lymphatic glands of the bronchi, those situated on the sides of the vertebral column, those of the mediastinum, the gastro-hepatic and gastro-splenic glands, &c. were entirely degenerated, and had acquired a considerable volume without any impediment to the circulation.

“Research has convinced me in like manner that tuberculous and hypertrophied bronchial glands cannot compress so as to flatten the bronchial tubes; and that consequently dilatations of the bronchial ramifications, (in other respects frequent in children,) can be looked on only as a secondary effect of this pretended compression, which itself cannot be announced either by any particular whistling sound, or by interrupted respiration.

“Pain in the sternum (presteral) belongs more especially to the symptomatology of bronchitis.

“The effect of lesions of the lymphatic glands of the bronchi, is to oppose the resolution of inflammations of the respiratory organs; to create a disposition to these inflammations; and to favour the development of pulmonary tubercles: witness the tenacity, the slowness of inflammations of the chest in children, who are so much disposed to those lesions; witness the frequency of relapses at their age, and the almost peculiar frequency of pulmonary tubercle amongst them.

“When tubercles are once developed, the inflammation which has produced them appears to be extinguished, they remain as it were stationary during a variable time, or at least their progress is very slow; but under the influence of inflammation of a neighbouring organ, they make a rapid progress in a short time.

“Bronchial tubercles may acquire a considerable volume, (that of a small hen egg, for example,) without producing (on account of their respective situation) the least displacement around them. But the extraordinary development of some of these organs may however occasion, in certain cases, the retreat of the neighbouring parts, when the mobility of these parts allows it.

“The degenerated bronchial glands generally contract new adhesions with the neighbouring parts, or only render their natural adhesions more firm. Perforations are the frequent result near the new points of contact, or at the natural points of contact that have become more intimately connected. These accidental openings, and consequently the ulcerative inflammations that produce them, become most evident after the softening of the tuberculous matter. But it is when the diseased glandular organ does not tend to compress the surrounding parts; for, in that case, although the period of softening of the tubercles may be hastened by any other neighbouring inflammation, we still find the tuberculous gland in the crude state when

the adhesions and perforations of which we have spoken have already taken place.

Having met towards the bifurcation of the bronchi, kysts, (*revenus sur eux mêmes*,) that had passed to the bony or cartilaginous state, or contained chalky matter, &c. &c., I should be inclined to think, that the softened tuberculous matter of the bronchial ganglions may be sometimes partly or totally absorbed. But in the great majority of cases, this matter has a tendency to be evacuated by the perforations before mentioned. These openings that afford it a passage, are observed chiefly on the bronchi, (a fact easily understood from their relations with the bronchial glands,) yet they occur elsewhere. These different results, as well as the phenomena, terminations, and various accidents combined with them, are laid before the reader in the following observations.

“OBSERVATION I.—*Perforation of a Bronchial Tube.*

“Catherine Copa, *æt.* 6, admitted in July, 1827; pale, thin, worn, and subject to catch cold; had cough for two months before admission. On admission her pulse was 110; skin hot, crepitating rale at the inferior part of the right lung, with dulness on percussion at the same point; pulmonary expansion less free at the right than the left side; frequent deep cough; no expectoration; very great oppression: weakness extreme; died three months after.

“*Autopsy.*—Several old adhesions uniting the pleura costalis and pulmonalis and the three lobes of the lung together. The right lung presented numerous traces of partial pneumonia, and many tubercles were found in its tissue. Tubercles, but less numerous, and traces of inflammation were scattered through the left lung. The mucous membrane of the trachea and bronchi was injected, but only in the spaces between the cartilages of the trachea; the bronchi contained some red and viscid mucus; the glands about and between the bronchi were voluminous and tuberculous. A considerable mass, resulting from the reunion of several of these tuberculous glands existed in front of the right bronchus; no compression had resulted from them, but a perforation had formed a communication between the right bronchus and a degenerated bronchial ganglion. The edges of this opening were red; it was in part stopped up by a clot of softened tuberculous matter contained in the ganglionic cyst.

OBSERVATION II.—*Perforation of a Bronchial Tube.*

“Anast. Milet, *æt.* 2 years, admitted June, 1826; had had cough four months; was extremely thin and weak. This child had neither crusts on the head nor swollen glands in the neck. His pulse was frequent and small; the skin cold; cough without expectoration; at a later period diarrhoea set in; respiration always impeded and frequent, but no particular sign could be deduced from percussion or auscultation. He died in a fortnight after admission.

“*Autopsy.*—In the head were found some spoonfuls of serum in the arachnoid cavity and in the lateral ventricles; in the thorax, the mucous membrane lining the bronchial tubes was pale throughout.

The glands about and between the bronchi had acquired, for the most part, the size of a large walnut: some five or six of these ganglia, entirely transformed into tubercles, presented towards their centre red striæ which seemed to be the last vestiges of the ganglionic tissue. Towards the root of the right lung, at the internal and inferior part of the superior lobe, and in the pulmonary tissue itself, were found two large tuberculous glands glued to a bronchial tube, which presented a perforation of three or four lines in diameter. This opening, the edges of which were pale and uneven, formed a communication between the tubercle and the bronchus. The tuberculous matter of the gland could scarcely be crushed under the finger. A portion of the tissue of the same pulmonary lobe, contiguous to the degenerated glands, was in the first stage of hepatization and studded with miliary tubercles. The two other lobes of this lung were healthy. The left lung presented some granulations, scattered towards the periphery and summit of the upper lobe.

“In the first of these two observations, the inflammation of the cyst of the gland, the intimate adhesion contracted with the neighbouring bronchus, the ulcerated opening, &c. appear to have followed the formation of the tuberculous matter. While in the second observation these different phenomena seem to have preceded the last period of alteration of the diseased ganglion. In the second of these cases, in fact, the tuberculous matter was found in little else than a crude state, and the particular situation of the tubercle shews, how, by the sole fact of the compression exercised on the neighbouring organ, there has resulted, first, a more close adhesion or binding of the cyst to the bronchial tube, and next the ulceration and perforation at the point of contact.

“From these and many other facts of the same nature, I can deduce, that bronchial phthisis, even when it has produced perforation of the bronchi, does not exhibit any particular symptom.

“To establish, on the contrary, that in such cases pectoriloquy and the expectoration of tuberculous matter, were sufficient to make the diagnosis clear, would be nothing more than plausible theory. In fact, clinical observations shew us, that children scarcely ever expectorate, and that pectoriloquy, so common in adults, is very rare with the former, and that several reasons already explained deprive us of the advantage of auscultation.

“OBSERVATION III.—*Perforation of a Bronchus and the Œsophagus.*

“Moreau, a girl aged six years, admitted into hospital July 24th. She was always liable to take cold; the glands of the neck were engorged; she had a cough of several months standing, but never kept her bed until eight days before admission. From that time she had much cough, fever, headach, and occasional vomiting.

“She presented the following appearance and symptoms:—gangrenous state of the mouth, (stomatite gangreneuse;) pulse 120: some diarrhœa; frequent cough; no expectoration; muco-crepitating rale at the right side; slight dulness posteriorly at the same side. She died the 14th of August following.

Post mortem.—Adhesions of the pleura at the two inferior thirds of the right lung ; some adhesions also at the left side. The superior lobe of the right lung posteriorly was found in a state of grey hepatization. The mucous membrane of the trachea and of the bronchi was generally pale. On the left bronchus, half an inch from the bifurcation of the trachea, was a round perforation, half a line in diameter, communicating with another perforation lengthened from above downwards, having smooth pale edges, and situated in the œsophagus. This latter perforation was a line and a half in extent, and two lines higher up than the preceding one ; the communication between them was by means of an intermediate cyst, formed of resisting fibrous tissue ; its internal surface was of a reddish brown colour. This cyst, the diameter of which might be considered at three or four lines in extent, had apparently belonged to a degenerated bronchial ganglion, whose softened tuberculous matter had escaped by the accidental openings we have remarked. The greater number of the other bronchial glands were slightly hypertrophied, and of a deep red ; several of them were partly tuberculous. The subject of this observation had been ill eight months before admission, and had cough and vomiting. Could the perforations above described, the borders of which presented no traces of recent inflammation, have had their origin at the above named period ?

“ OBSERVATION IV.—*Perforation of a Bronchus and the Œsophagus.*

“ Eliza Thomas, aged three years, was admitted December 20th, 1827. She was affected with spontaneous luxation of the right thigh ; and had cough and general bad health for four months, during which time she had become very thin, and for the last month the cough had been aggravated.

“ Her pulse was 96 on admission ; cough rather frequent, but no expectoration ; respiratory murmur natural, and unmixed with rale ; percussion was equally sonorous. At a later period she had some vomiting ; the face changed ; the fever increased ; the pulmonary expansion became more free at each side of the chest, accompanied by a rale not very characteristic ; diarrhœa set in, and she died on the 28th of the same month.

“ *Autopsy.*—The bronchial glands were voluminous and tuberculous, and some of them were softened in the centre. The mucous membrane of the larynx and upper part of the trachea was pale ; that of the latter (towards its termination) and of the bronchi was rather red. In the right bronchus, half an inch from the bifurcation, was a perforation with red irregular edges, communicating directly with a tuberculous and softened bronchial ganglion, and indirectly with the œsophagus, by means of an accidental opening, a line and a half in diameter, and having smooth red edges. Both lungs contained granulations. The inferior lobe of the left lung presented several traces of inflammation scattered here and there through its tissue, (hepatization rouge.)

“Of the children admitted to the Hospital des Enfants Malades, four-fifths of the deaths are caused by lesions of the lungs. Amongst one hundred and sixty patients, who died from pulmonary affections, during the years 1826 and 1827, only four presented those double perforations which I have described; they may then be considered as occurring in one patient out of forty.

“Nothing is more common than to see children vomit in chest affections. Vomiting then cannot be considered as a symptom of accidental communication between the bronchi and the oesophagus. I was inclined to think, that where this morbid condition existed, liquids might be conveyed by the act of swallowing, into the bronchial tubes, and thus cause violent fits of coughing; but I found the same pathological state in dissecting children, who had never coughed after drinking: while, on the contrary, I have seen children affected with simple bronchitis, cough severely after taking some mouthfuls of liquid.

“OBSERVATION V.—*Perforation of the Pulmonary Artery.*

“Maria Berrell, æt. 11, admitted February, 1828; she has been troubled with cough since her recovery from small-pox, in the September preceding. The left side of the chest does not expand as much as the right; dulness on percussion and some rale at the same side. This young girl preserved her plumpness, and was without fever. A blister was applied to the back, she was allowed middle diet, and permitted to go about. The 16th of June, while laughing, she was seized with hæmoptysis, which proved mortal. The respiration was suspended, and the pulsations of the heart imperceptible on the instant; yet the brachial, radial, and carotid arteries continued to beat for twenty minutes after.

“*Autopsy.*—The tissue of the liver was soft, and of the colour of wine lees. The spleen was voluminous, its tissue rather soft, and of a violet red. White albuminous concrete granulations existed on its surface. On cutting into it, some miliary tubercles were found.

“The stomach was very much distended, and contained a great deal of blood, both fluid and clotted; the mucous membrane of this viscus, and that of the digestive tube, were natural.

“The volume of the heart was natural. At the surface of the left lung were found some thick resisting pseudo-membranes, and granulations were diffused throughout its tissue. The right lung was also surrounded by false membranes, particularly towards its base; its lobes were adherent, the bronchial glands were voluminous, and most of them contained tuberculous matter in their centres. In some this matter was softened, while the tissue surrounding the glands was red, shining, and thicker than usual. The mucous membrane of the trachea was pale, that of the bronchi much injected. In the left bronchus, above its division, was a perforation of three to four lines in diameter, communicating with a similar perforation of the pulmonary artery above the point where its bifurcation takes place. Between these two perforations was a cavity, formed from a number of tuberculous and softened bronchial glands. Of many of the latter,

there remained only the cysts adhering to the *unaltered* pulmonary tissue.

“ The perforation of the pulmonary artery existed at its inferior part, while the perforation of the bronchus was at its upper part.

“ OBSERVATION VI.—*Perforation of the Pulmonary Artery.*

“ Aug. Marvain, æt. three years and a half, had had measles at eighteen months old; was admitted December 22nd, 1826, affected with enteritis and bronchitis. Her pulse was excited and the cough frequent. The attention was directed chiefly to the abdomen, from the pain she complained of there, this symptom being accompanied by diarrhœa. One evening, about three weeks after admission, she was suddenly attacked with hæmoptysis, and she died while blood continued gushing from her mouth and nostrils.

“ *Autopsy.*—The enlarged bronchial and tracheal glands were transformed into a dense homogeneous mass of tuberculous matter, but not softened. All the mucous membrane of the air passages were of a remarkable milk white colour. The right lung was studded with granulations of different shades of opacity, and projecting on the cut surface of the lung. Some clots of blood were found in the larynx and trachea, and here and there throughout the bronchial tubes of the left lung. The latter was adherent to the pericardium, and in the middle of the adhesion were found some granular albuminous concretions. The upper lobe of the same lung was adherent to the ribs, and in the pulmonary tissue beneath this adhesion was a large cavity the size of a hen’s egg, lined by a false membrane, and surrounded by an hepatized layer. This cavity was prolonged towards the root of the lung, and there communicated with a bronchial cyst, which presented a large opening, through which access was obtained to the left trunk of the pulmonary artery: the latter was perforated just at the point where it divides to supply each lung.

“ The great cul de sac of the stomach presented two ulcerations, each the size of a sixpence, pale at the bottom and red and elevated at the edges.

“ These two latter observations contain the details of facts perhaps hitherto unheard of; they prove the inefficacy of clinical observation, in prognosticating the fatal and sudden termination of certain morbid actions.

“ The possibility of accidents so dreadful, the latent progress of the lesions that give rise to them, the inefficiency of art in the treatment of tuberculous affections, &c., all concur in rendering the prognosis of bronchial phthisis nearly hopeless.

“ Though even in some cases (as perforation of the bronchi and of the œsophagus) we should suppose that a fatal termination should not occur in this disease; and though we might conceive a cure to occur from the evacuation of the softened tuberculous matter; and from the contraction and cicatrization of a cyst or of fistulous openings, many reasons should oblige us to consider these pretended cures only as partial, incomplete, and doubtful. In fact, it rarely happens that

only one or two bronchial glands are affected ; and besides, the affections of these glands, almost always consecutive to that of the organs of respiration, follow or precede the progress of the latter, so that when from inflammation the bronchial glands have become tuberculous, very often at that time tubercles have developed themselves in the lungs.

“ *Tuberculous degeneration* of the bronchial glands is always a serious affection ; 1st, because it may occasion the most fatal accidents ; 2nd, because it may prevent resolution of pulmonary and bronchial inflammations, &c. ; 3rd, because it may favour the development of tubercles of the lung ; 4th, it may cause the exhaustion of the patient, and the production of hectic fever. The want of characteristic signs in this disease, is far from diminishing the serious nature of the prognosis.

“ At most, we can only suspect the existence of a pathological state of the bronchial glands. Meantime such conjectures will become likely enough, when we shall have to pronounce on the state of young subjects presenting the lymphatic temperament, or what is termed, scrofulous appearance, such as those who have coughed, or had pneumonia or bronchitis, &c. for three or four months.

“ There are scarcely any rational signs to help us in the diagnosis of bronchial phthisis, whatever may be its period or degree.

“ The preceding pages ought strongly to impress the importance of the prophylactic treatment in this disease. Without recalling all the principles of treatment as to diet, air, exercises, &c., applicable to the removal of the general causes already pointed out, I need not insist on the necessity of treating in the *most complete manner* the pulmonary, bronchial, or pleural inflammations of children, nor on the danger of *incomplete resolution* at their age. The judiciously prolonged continuation on the means proper to obtain the cure of these different inflammations is the more indicated, as it is on a methodical antiphlogistic treatment that we must rely, in arresting any inflammation which generally brings on or accelerates the softening of tubercles. An important consideration, as we cannot anticipate the degree of alteration of the bronchial glands, and doubly important since the coincidence of bronchial and pulmonary tubercles has frequently been observed, and as it is known that the period of crudity of tuberculous affections is susceptible of being prolonged, often for a long time. But after tubercles have once softened the chance of cure is uncertain indeed.

Dictionnaire Historique de la Médecine Ancienne et Moderne, &c.—Par MM. DEZEIMERIS, OLLIVIER (D'Angers) et RAIGE-DELMORE, Docteurs en Médecine. Tome Premier, pp. 446. Paris, 1828.

WE have hitherto avoided noticing this work, as we were anxious to observe whether in its succeeding volumes it would

be conducted in the same spirit, as that in which the first was composed. But we may now recommend this Dictionary to all those of our readers, who are not content with spending their lives in "the practice of the profession," but who are led to look now and then into its archives, and from the ripened field of the past, to glean the seeds of that future science in whose perfection they hope to bear a part.

It is an old remark, that the facts on which medicine is based are so numerous, as to be for the most part hidden from the common observer. For twenty-five centuries have its riches been accumulating; but it is only in our own time that attempts have been made to arrange and classify those votive tablets, which were the fruit of the suffering, and observation, and philanthropy of man, for more than two thousand years. Were it not for such attempts, the labours of the past would be in a great measure useless; for, as our authors observe, the life of the most laborious man could not suffice to collect even the facts of medicine, nor could the most excellent memory retain them to any degree. It is here that the value of scientific or literary history is observed. This may be divided into that of the subject with all its collateral branches, and that of the author or observer, so far as he is connected with it; and hence, to all who are engaged in the study of the medicine of a former period, such a work must be invaluable as giving a ready key to the sources of information. To those too who are labouring for the advance of medicine, and who wish that their observations should be "*rendered fruitful by study*," we heartily recommend this Dictionary, as a work which must greatly assist them, were it only by its bibliographical riches.

This is not a dictionary of medicine, as the expression is commonly used in this country; it does not profess to teach the history of disease; but rather that of the study of disease. Hence we find that the articles are reducible to two classes: first, the history of subjects which have a relation to medicine; and secondly, that of those authors who have contributed by their writings or discoveries to the advancement of the science. As examples of the first class of articles, we refer with pleasure to those of Anatomy, Accouchement, and the medical history of the Arabians; and of the second, to those devoted to the history of Bacon, of Bichat, and of Barthez. Indeed, nothing can be better than the mode in which this portion of the work is managed; there is nothing superfluous, nor yet is the detail too meagre; and at the end of each article a catalogue of all the works of the respective authors, with their dates and places of publication, is added. To these, in many cases, short but excellent notes are added, explanatory of the works, or the views

of the respective authors ; and it is here the greatest knowledge is displayed on the part of the writers of this work. We may further remark, that the charge against the French writers of neglect of English medical literature, cannot apply to these authors, inasmuch as the most minute knowledge of British writers is shewn throughout the work. We venture to say, that some of our French-despising teachers, will find in the pages of this work, notices of the lives and actions of many of their own countrymen, of whose very existence they were ignorant before.

We beg to congratulate the learned authors on the success of their undertaking, and we feel certain that the work, in itself a library of the most interesting and important kind, must find a place in all collections devoted to the science of medicine.

To the Editor of the Dublin Medical Journal.

SIR,

I am by no means anxious to jostle a Reviewer in his path, but a passage in the review of a little book on Cholera, in the last number but one of the Dublin Journal of Medicine, in which my name is introduced, demands of me some notice. "The results obtained in the Grange Gorman cholera hospital," says the reviewer, "were not known to the medical men of Dublin; for the only publications which spoke of the practice pursued in that establishment, was an excellent paper by Mr. M'Coy, published originally in this Journal, and since re-published in the Dublin Evening Post, and I believe in other newspapers. Mr. M'Coy does not even mention the acetate of lead, but relies altogether upon the frequent exhibition of very large doses of calomel. No wonder then that no advantage was derived from the previous experience of the good effects of acetate of lead at Grange Gorman hospital." Had there been any reader of this passage addicted to thinking ill of his neighbours, he might have supposed me guilty of a *suppressio veri* in regard to acetate of lead. Now the truth is, that until I read the above, I knew nothing of even the *trial* of this salt in the Grange Gorman hospital; and this is the more extraordinary, as during some months of my sojourn there I sought every opportunity of acquainting myself with every thing that could enlighten me as to the nature and treatment of the disease. When I found calomel succeed, I was rather importunate to have its merits tested by others in the Establishment. If any person there obtained success from other acids, I should have

expected him to have done the like, from humanity and every professional obligation. I cannot explain why a remedy said to have done such wonders in 1832, remained unknown to the practitioners of Dublin in 1834, as the reviewer states it did ; but certainly all I knew I told at once, under the apprehension of a second visitation. I conveyed it to the *profession*, because I conceived it could only benefit the public through *them*, and had I at the time known of any better treatment than my own, I am sure no unworthy motive could have induced me to conceal it or its discoverer. To this moment I have not any personal experience of the value of acetate of lead in malignant cholera.

I am Sir,

Your very obedient Servant,

S. M'COY.

26, *French-street*.

SCIENTIFIC INTELLIGENCE.

CHEMICAL AND PHYSICAL SCIENCE.

On Respiration, by Thomas Thomson, M. D., F. R. S., L. and E., &c., Regius Professor of Chemistry in the University of Glasgow.—When the experiments on respiration were made by Lavoisier, Goodwin, Menzies, Davy, &c., towards the end of the last century, it seems to have been the generally received opinion, that every individual by inspiring the air into his lungs, produces the very same change upon it. At least, the conclusions respecting respiration to be met with in physiological and chemical books, depend for their accuracy, upon this assumption. Nothing, however, can be farther from the truth. The chemical changes produced in air by respiration, vary in their extent, not only in different individuals, but even in the same individual at different times; and that to such an extent, that if we analyze air thrown out of the lungs at different times, we find the quantity of carbonic acid sometimes not to exceed two per cent., and at other times to amount to more than seven per cent. Dr. A. Fyfe and Dr. Prout have shewn many years ago, that an alteration is produced in the quantity of carbonic acid in the air expired, by the mode of living of the individual: that when the constitution is affected by mercury, the proportion of that gas in the air expired is diminished, and that it is diminished also by nitric acid, by spirits, and by a vegetable diet. But I have found that the most unexpected alterations are observable in the same individual, though he be in perfect health, and though he make no sensible alteration in his mode of living.

During the course of the month of May, 1832, I analyzed air from my own lungs on ten consecutive days, between eleven and twelve o'clock each day. Before stating the results, it may be proper to mention the method of analysis employed. I procured a glass tube, capable of holding about three cubic inches of air, and about half an inch in diameter. It was shut at one end and open at the other. This tube being filled with mercury, and placed inverted on a mercurial trough, I introduced into it about two and a half cubic inches of air from my lungs, taking care, in the first place, by making half an expiration through a narrow glass tube, to expel all the common air from the trachea and mouth, and also from the tube, by which it was conveyed to the eudiometer. The surface of the mercury in the tube was then marked by tying round it a sewing thread,

and the whole was left till the air ceased to contract. Then a quantity of moderately strong potash ley was introduced, and the whole was left untouched for twenty-four hours. The diminution of bulk of the air was then carefully marked, by tying a sewing thread round the tube at the new surface of the mercury. I then filled the tube with mercury, up to each of the places marked by the sewing threads, and weighed each portion of mercury. The difference between the two weights, gave the diminution of bulk sustained by the air, by the absorption of its carbonic acid. I then calculated, what the bulk of the air and of the carbonic acid gas absorbed would have been, at the mean pressure and temperature; making allowance for any change in the height of the barometer and thermometer, which took place during the interval. I ought to observe, however, that during the ten days of these experiments, both the barometer and the thermometer were tolerably steady.

The following table exhibits the volume of carbonic acid gas, in 100 parts of the air expired from my lungs during each of the ten days, at eleven o'clock A. M.:—

CARBONIC ACID.			CARBONIC ACID.		
1	-	4.64 per cent.	6	-	2.05 per cent.
2	-	4.70 "	7	-	2.39 "
3	-	6.07 "	8	-	3.85 "
4	-	3.27 "	9	-	3.05 "
5	-	5.26 "	10	-	7.16 "

I was not a little surprised at these results: the differences being so much greater than I had anticipated. The mean of the whole is 4.24 per cent., which, therefore, I am disposed to consider as representing the mean quantity of carbonic acid gas, contained in 100 volumes of air expired from my lungs.

I was naturally induced to examine the air from the lungs of several other persons, in order to see whether there would be the same difference in theirs as I had observed with respect to myself. The gentlemen whose breathing was examined, were chiefly those who were occupied with practical chemistry in my laboratory. The following table exhibits the results obtained:—

			CARBONIC ACID.	
Mr. Thomas Thomson, (aged 14)			3.06	per cent.
Ditto, next day	-	-	3.61	"
Mr. J. Colquhoun, (aged 18)			3.09	"
Mr. Forrest, (aged 18)			2.10	"
Ditto, next day	-	-	5.19	"
Mr. Coverdale	-	-	2.54	"
Ditto, next day	-	-	1.71	"
Mr. Cargill	-	-	4.68	"
Mr. Bruce	-	-	5.46	"
Dr. Duncan	-	-	6.17	"
Dr. Short	-	-	6.85	"
Mr. Frazer	-	-	7.08	"

I prevailed upon two ladies to allow me to examine the air from their lungs. The first was an unmarried lady about seventeen years of age; the second a married lady, aged about thirty. The results were as follows:—

First lady - 2·35 | Second lady - 4·06

The diversity here is fully as great as in my own case, but the mean of the whole does not differ much from that of my own. I am disposed, therefore, to infer from these trials, that the average volume of carbonic acid gas, in 100 volumes of air, expired from the lungs at eleven o'clock A. M. is 4·24.

But, from Dr. Prout's experiments, (*Annals of Philosophy*, II., 328; and IV., 331,) it appears that the quantity of carbonic acid gas produced by respiration, is at its maximum at noon, and that its quantity, at eleven A. M. is to the mean quantity for twenty-four hours, as 3·92 to 3·45. It is obvious, from this, that the mean volume of carbonic acid gas in 100 volumes of air expired, deduced from the preceding experiments, is 3·72.

I made a few trials to ascertain how much air different individuals are capable of forcing out of their lungs after a full inspiration. The quantity, as might be expected, varies much in different individuals. But when the same individual repeated the trial, the result was very constantly the same. The following table shows the results:—

Mr. T. Thomson	150	cubic inches.
Mr. G. Thomson	163	"
Dr. Duncan	- 180	"
Dr. Thomson	193	"
Mr. J. Colquhoun	200	"
Mr. Coverdale	200	"
Mr. Bruce	- 200	"
Mr. Forrest	- 200	"
Mr. Frazer	- 200	"
Dr. Short	- 210	"
Mr. Cargill	- 250	"

200 cubic inches is the most common quantity; but in one case it amounted to as much as 250.

The number of respirations in a minute does not vary much in different individuals, being very nearly twenty, or rather between nineteen and twenty.

I believe that great errors have been committed in the attempts to determine the quantity of air thrown out of the lungs by a common expiration. I am satisfied that the quantity which I pitched upon from the experiments of Menzies, Lavoisier, &c., namely, forty cubic inches is far too high. I find, after a great many trials, (for it is very difficult to make a natural expiration when your attention is called to it,) that the quantity of air which I myself throw out at a natural expiration, is sixteen cubic inches. My nephew, Dr. Andrew Steel, who was a tall man, (about six feet,) with an expanded chest,

also made many trials, and satisfied himself that his ordinary expiration was sixteen cubic inches. Messrs. Allen and Pepys determined the volume of air expired by them at an ordinary expiration, to be sixteen and a half cubic inches. From these facts, I think we are entitled to conclude that a common expiration does not much exceed sixteen cubic inches.

If these data be correct, and they cannot be very far from the truth, it will be very easy to calculate the quantity of carbon thrown out of the body daily by respiration. Allowing 20 respirations per minute, and sixteen cubic inches of air taken in and thrown out at each respiration, we have 28,800 respirations in 24 hours, and 460,800 cubic inches of air passing through the lungs. Of this $\frac{37.2}{100}$ or 17141.76 cubic inches are converted into carbonic acid gas. Now 100 cubic inches of carbonic acid weigh very nearly 50 grains; so that the weight of carbonic acid formed is 8,570.8 grains, $\frac{3}{11}$ ths of which, or 2337.5 grains are carbon. This amounts to nearly nine ounces avoirdupois, or somewhat more than half a pound.

On the Changes produced in the Composition of the Blood by repeated Bleedings, by Thomas Andrews, Esq.—The object of the following experiments is to determine with precision, the changes which are produced in the composition of the blood by repeated abstractions of large quantities of it from the general circulation. In the human subject, opportunities seldom occur of procuring proper specimens for examination, although the operation of venesection is so frequently performed, as in those cases where it requires to be repeated at short intervals the blood is generally in a morbid state. Instead of waiting for such casual occasions, I directed my attention to those animals in which the composition of the blood is nearly the same as in man, conceiving that similar results would in either case be produced. I selected the blood of calves for the purpose of experiment, and as it is the practice of butchers in this country to bleed these animals several times before they are slaughtered, I availed myself of this circumstance to procure suitable portions of blood. The animal is bled from a large orifice in the jugular vein, till symptoms of syncope appear, and the operation is in general repeated at intervals of twenty-four hours. It is once fed between each operation upon a mixture of meal and water, but this is often omitted before the last bleeding.

The appearance of the blood becomes greatly altered by the successive abstractions; the crassamentum is at first very large, and a portion of the red globules are unattached to it, but it progressively diminishes in bulk while its consistency increases, till upon the fourth bleeding it appears a small contracted ball immersed in a large quantity of serum, adhering to the stopper of the vessel in which it is contained, and presenting on its external surface an exact cast of the interior of the vessel.

The following analysis were performed by the same method that I formerly employed in a set of experiments on the blood of cholera patients, which were published in the *Philosophical Magazine* for Sep-

tember, 1832. They are nearly all a mean of two separate analysis which seldom differed from each other more than 0.5 per cent.

A calf was bled four times ; between the first and second bleedings a week elapsed, but the rest took place at intervals of twenty-four hours, and the animal was fed between each operation. The composition of the serum and blood at each bleeding is exhibited in the following tables :

SERUM.

	FIRST.	SECOND.	THIRD.	FOURTH.
Water	92.19	93.96	93.81	94.18
Albumen and Salts . .	7.82	6.04	6.19	5.82
	100.00	100.00	100.00	100.00

BLOOD.

	FIRST.	SECOND.	THIRD.	FOURTH.
Water	81.36	85.49	87.41	89.25
Albumen and Salts . .	6.89	5.50	5.77	5.52
Red globules and fibrin	11.75	9.01	6.82	5.23
	100.00	100.00	100.00	100.00

The serum had at the third bleeding, a specific gravity of 1.020, and at the fourth, of 1.017. At the third bleeding, the specific gravity of the blood itself was 1.031.

The next calf whose blood was examined, was nine weeks old. I did not procure any blood from the first bleeding. The third bleeding was twenty-four hours after the second, and during that period the animal was once fed ; twelve hours afterwards it was bled a fourth time, but it received no more food :

SERUM.

	SECOND.	THIRD.	FOURTH.
Water	93.32	94.39	94.59
Albumen and Salts	6.68	5.61	5.41
	100.00	100.00	100.00

BLOOD.

	SECOND.	THIRD.	FOURTH.
Water	82.05	89.14	88.92
Albumen and Salts	5.85	5.29	5.06
Red Globules and Fibrin	12.10	5.57	6.04
	100.00	100.00	100.00

The albumen and salts it is evident, decrease at each bleeding; the diminution is, however, very variable, and even after the fourth time, does not amount to one per cent. and a half. In the globules, the same diminution takes place, but to such a degree that they are at least reduced to less than one half their original quantity. To this principle, a remarkable exception occurs in the composition of the blood taken at the last bleeding of the second calf, where the globules are slightly increased above the preceding analysis; but it will be observed, that the animal received no food during the intervening period, from which the blood might obtain a fresh supply of serum, while the tendency of the different excretions of the animal was to drain from the circulating mass its aqueous part, and thus to increase the apparent quantity of the globules. This explanation is confirmed by the following analysis.

A calf three weeks old was bled twice before it was killed, twelve hours elapsed between the two bleedings, during which time it obtained no food:—

SERUM.

	FIRST.	SECOND.
Water	92.48	93.35
Albumen and Salts	7.52	6.65
	100.00	100.00

BLOOD.

	FIRST.	SECOND.
Water	82.48	83.47
Albumen and Salts	6.70	5.95
Globules	10.82	10.58
	100.00	100.00

The globules have here it is true diminished at the second bleeding, but so slightly, that we may attribute this circumstance to the unassimilated chyle which must have been present in the system. In the former case, the animal had been exhausted by previous depletions, and hence possessed no store from which the blood could derive even a small portion of serum, as in the latter instance.—*Records of General Science*, Jan. 1835.

On the acid nature of the Blood, and the distinction between Arterial and Venous Blood, by R. Hermann. (Poggendorff's Ann. xxxi.)—Three years ago the author announced that he had discovered acid in the blood, but his position was not admitted by any chemist. In 1833, he took advantage of the presence of Dr. Stevens in Moscow to repeat his experiments. He found 1. That neutral tincture of litmus was coloured red by venous blood taken from the arm of a healthy Russian aged 31 years.

2. The coagulum being rubbed up with distilled water boiled, and the solution containing the salts concentrated, the residue did not alter tumeric, and had a doubtful effect upon litmus paper.

3. 720 Grains of venous blood fresh from the arm, were heated with a solution of muriate of lime in a pneumatic apparatus, and the gas extricated was collected over mercury. Potash absorbed, $\frac{1}{6}$ Russian cubic inch carbonic acid.

6. Venous blood was coagulated at a high temperature, and the coagulum boiled with water and evaporated. The concentrated residue exhibited an acid nature to tincture of litmus, and to red litmus paper rendered red, an alkaline state. On examination, he discovered that the distilled water employed, contained phosphate of soda, and observed that he could produce this paradox, by adding to phosphate of soda some acetic acid. As the neutral phosphate of soda has an alkaline effect upon vegetable colours, he conceives that the acid re-action of the blood is to be attributed to the presence of acetic acid.

6. Tincture of litmus mixed with fresh serum, was rendered red. Red litmus paper became blue in the same liquid. When heated in a pneumatic apparatus, carbonic acid escaped.

Dr. Stevens observed that the colouring matter of the blood is at first dark, but at last black. In this state it is obtained, when the coagulum is digested in distilled water and the salts thereby removed. The dark hue of the colouring matter is quickly changed to arterial red, when it is brought in contact with the neutral salts, and the red colouring matter becomes dark when added to acids, even carbonic acid. The venous blood contains free carbonic acid, which can be removed, not only by exposure to the atmosphere, but even to hydrogen at common temperatures. By these means, he explains the difference between arterial and venous blood. Hermann states, that he had made similar observations previously.

It has been shewn, (*Ann. de Chimie* xix.) that when arseniate or phosphate of soda appears in a solution, which with the addition of arsenic or phosphoric acid, exhibits an alkaline re-action, the liquid after crystallization is strongly acid; but if potash is the base of the crystallized salt, then the solution is alkaline. In the first case the salt is neutral, in the last, acid. Litmus paper moistened with a solution of biphosphate or binarsenate of potash becomes red, dried it becomes blue, when the salt by crystallizing takes up the acid, which reddened the litmus paper.—*Ibid.*

Method of destroying Mice, &c. in their lurking places. (*Ann. de Chim.* xlix. 437.)—M. Thenard in 1832, submitted to the Academy of Sciences a plan for destroying noxious animals when they have taken refuge in their hiding places. The instrument of destruction is sulphuretted hydrogen, which he had remarked to be peculiarly deleterious to animal life. Animals when allowed to breathe the pure gas fall down as if struck with a bullet. Even when considerably diluted with atmospheric air, the effects are deadly. A

horse dies in less than a minute, in air containing $\frac{1}{250}$ of this gas. A dog of moderate size is speedily killed in air possessing $\frac{1}{1000}$ while a green finch expires in a few seconds in air possessing $\frac{1}{1500}$ of sulphuretted hydrogen. Influenced by these facts, the French chemist proposed the employment of this gas to several individuals for the purpose of extirpating noxious vermin, but his suggestions being treated with indifference, he determined to put the method in practice by his own experiments.

His first trial was in an apartment infested by rats, which shewed themselves occasionally during the day, and at night were actively engaged in plundering a chest of oats, to which they had access through an aperture of their own formation. The holes by which they retreated amounting to eighteen in number, Thenard adapted to each of them in succession retorts capable of containing half a pint measure, by introducing the beak of the retort, and filling up the interval round its neck with plaster. Sulphuret of iron was deposited in the retort, formed from a mixture of iron filings, sulphur, and water, and dilute sulphuric acid was introduced by means of a tube placed in the tubulure. The sulphuretted hydrogen was disengaged with great rapidity, and in a few minutes not a rat remained alive in the building. His next experiment was in an old abbey, where he was equally successful, and having opened up part of the wall, he found many dead rats. He recommends the application of this method to the destruction of moles, foxes, and all animals which cannot be extirpated by the usual means. Thenard then gives popular directions for the formation of the materials required to produce the gas.

Mix four parts of iron filings, three parts flowers of sulphur in a mortar with a pestle. Place the mixture in a convenient vessel, and moisten it with four parts of boiling water, stirring it with a piece of wood or glass. Add gradually afterwards four parts more of water, and introduce it into the retort. Pour upon the mixture common oil of vitriol diluted with five times its volume of water, and continue to add it gradually till the effervescence ceases. Should any of the gas escape into the apartment and occasion inconvenience, it may be removed by dropping a little sulphuric acid upon bleaching powder. The holes should be closed immediately, to prevent the disagreeable effects of the putrifaction of the carcasses of the animals which have thus been destroyed.—*Ibid.*

Mode of detecting some Organic Acids, by H. Rose, (Poggendorff's Annalen. xxxi.)—Tartaric, racemic, citric, and malic acids may be readily detected in the following manner: dissolve them in as small a quantity of water as possible, and add to the solution an excess of lime water, so that reddened litmus paper may become blue.

Tartaric and racemic acids form a precipitate in the cold state. That produced by the tartaric acid dissolves completely in a small quantity of a solution of ammonia, while that of the racemic acid remains insoluble. Both acids can likewise be readily distinguished by their treatment with a solution of sulphate of lime, when after some

time racemate of lime is deposited, while the solution of tartaric acid is not affected.

The solution of citric acid yields no precipitate with lime water in the cold state, but when heated, a considerable precipitation occurs. If a small quantity of a very dilute solution of citric acid is mixed with lime water, a precipitate falls by boiling, which is taken up by allowing the solution to cool. The solution of malic acid occasions no precipitate with lime water, either in the cold or by boiling. For these experiments completely saturated lime water should be employed.—*Ibid.*

Effect of Gases on Vegetation, by M. Macaire. (Ann. des Sciences Naturelles.)—M. Macaire introduced some plants of Euphorbia, Mercurialis, Senecio, Sonchus, &c. into vessels along with chloride of lime in the morning. When evening arrived the plants had not suffered, and the odour of the chlorine was as strong as at first. Next morning they were found withered, the smell of chlorine had disappeared, and was replaced by a very disagreeable acid odour. The same result was obtained on repeating the experiment several times.

Nitric acid withered the plants during the night, but in the day time merely rendered some of them brown coloured.

Sulphuretted hydrogen produced no alteration when light was present, but destroyed them in the night, by the absorption of the gas.

Muriatic acid gas acted in a similar manner.—*Ibid.*

NATURAL HISTORY.

A Shower of Toads.—Several letters have been addressed to the French Institute on this subject, from persons to whose characters credit might be attached. They describe small toads or frogs to have been seen falling, and caught on an umbrella, a handkerchief spread out for the purpose, or the leaf of a shovel hat, &c. &c. Some of these young batracians hardly the size of a small nut, presented a rudiment of tail, proving, that they were very near to their period of metamorphosis. So much for the facts; as to the explanation of the phenomena, there is one, that has been generally admitted by those who admit the fact itself, viz., that the solar evaporation carries up with it the spawn of the frogs and toads contained in the water of marshes; that this spawn retained in the cloud, formed of the condensed watery vapours, is hatched there, and undergoes its changes, and is precipitated when the cloud which bears it is resolved into rain. The electricity of the clouds, would facilitate and hasten the development of those animals.

M. Duparcque, writer of one of the above mentioned letters, at-

tributes the phenomenon (of which he has been a witness) to the action of water-spouts. According to him, one of these whirlwinds which precede storms in the great heats of summer, in crossing marshy situations at the period of the transformation of tadpoles into frogs in fields, raise up masses of these animals, with a portion of water which they abide in; and the water-spout becoming larger, and forming a stormy cloud, will at a later period vomit them forth, with the lightning and water it contains. The carrying off these animals is facilitated by their leaving their subterranean retreats, and coming to the surface of the water on the approach of rain.

In support of this theory, M. Arago related, that when in England, Mr. Dalton told him, that he had several times collected, in a pluriometre, at the distance of six or seven leagues from the coast, sea water which had been brought thither by the wind.—*Revue Medicale*, Nov., 1834.

Memoir on Animal Electricity, by M. C. Matteuci.—Wollaston was the first who attempted to explain the animal secretions by the electro-chemical theory; by looking closer into this subject, I have succeeded in obtaining by means of the voltaic pile, fluids the chemical nature of which was analogous to that of the fluid of the kidneys and liver. I have also demonstrated the decomposition of the metallic salts to be met with in the circulation, as for example, oxides in the bile, acids in the urine, &c. &c. But all this was not demonstrating the existence of the electric state of the secreting organs, it was, on the contrary, supposing the thing demonstrated.

In a work presented to the Academy of Sciences, in January, 1834, M. Donné has succeeded in demonstrating the existence of opposite states of electricity in the skin and mucous membrane of the mouth, and also between the stomach and liver of all animals he has found extremely energetic electric currents. The fact is beyond doubt, and is reproduced in the same manner and degree as that observed by M. Donné. It is, however curious, that he inclines to explain these currents by the action of the acids and alkalies, which are separated by the different organs. It is by reflecting on the weak alkalinity and acidity of the secreted liquors, on the imperfect conductivity of the greatest number of the organized substances, that I have doubted the truth of this theory, and that I have been led rather to look on these alkaline and acid substances as produced by opposite states of electricity proper to the secreting organs. In other respects, the nature of the current favoured this supposition. But as it was possible to decide by experiment, I wished to try it. The reasoning is simple, if the electric current depend on the action of the secreted acids and alkalies, it should continue after the death of the animal since those do not disappear. By touching the stomach and liver of a rabbit with the platina extremities of a galvanometer, there was a deviation of 15° to 20° . I had cut off all the blood-vessels and the nerves which are given off from the abdomen to the diaphragm. Afterwards renewing the experiment, the deviation was

reduced to 3° or 4° ; lastly, by cutting off the head of the animal the deviation ceased altogether. It was only by introducing into the spinal marrow a wire, and thus exciting strong contractions, that I have been able occasionally to reproduce the deviation, and then but slightly. It was necessary to obtain a speedier death, and I had recourse to the hydrocyanic acid. I took another rabbit and observed the currents of the stomach and liver. The extremity of a glass tube was then introduced into the chest, and the hydrocyanic acid made to pass from cyanuret of mercury. Death in this case was preceded by some convulsive motions. The electric current appeared and disappeared; its presence seemed to depend on the convulsive shocks, and was produced interruptedly; at length it completely ceased. It is needless to say that I have always verified, after death and the cessation of the currents, both the acidity and alkalinity of the stomach and liver. On a great number of frogs I have also verified the same results. The current continues present even after the acidity of the stomach has been neutralized by any alkali. It is then during life, and by life, that these electric states exist and are produced.

It remained next to be seen by what organs this electricity traversed the body, and by what organs it was produced. M. Pouillet has observed, that he never has been able to produce electric currents by tracing the nerves with the platina extremities of a galvanometer. M. Nobili has declared that he has constantly seen a current between the muscles and nerves of a prepared frog. And I myself have lately announced that I had discovered an electric current, by tying the cut extremities of the pneumogastric nerves with leaves of platina, communicating with the galvanometer.

I am not at all surprised at the results obtained by M. Pouillet, nor at my being unable to verify the results of M. Nobili; after having observed that even a strong current from a pile of ten pair of plates sent through a prepared frog, never quitted the organs of the animal to enter the wire of the galvanometer. Whether the current be passed through the muscles only, or through the nerves, or both, the intermediate galvanometer is never affected by it, on the contrary the frog is always excited. I have isolated the nerves of a frog's thigh, by cutting off all the muscular part of it; the same current, though exciting convulsions, has never left the nerve to pass through the wire of the galvanometer, the extremities of which touched the cut surfaces of the muscle. Finally, leaving the muscle untouched, I tied the extremities of it round the platina ends of the galvanometer; the electric current of the pile in this case excited but feeble contractions, and an almost imperceptible deviation is perceived in the needle. These results are observed whatever may be the direction of the current, with respect to the distribution of the nerves. Recurring, therefore, to my former experiments on the pneumogastric nerves, and repeating with all possible precision, I have been reluctantly obliged to observe, that no current presents itself in these nerves, and that when they do manifest themselves it is owing to some foreign causes.

Opposite states of electricity exist then in living bodies. It is to

those states that secretions are, in all probability, owing ; but we are not acquainted with what organs they can be transmitted and produced. This electricity is concealed from us by the organization. The torpedo may lead to the discovery of its secret action.—*Annales de Chimie et de Physique*, August, 1834.

Leucosis, (Leucopathia, Albinoismus.)—The pink colour of the iris and pupil of the eye in Albinos, is owing solely to the blood that is present in that organ. This is easily proved by killing an Albino rabbit and cutting one of its eyes out of the orbit ; the vessels being thus divided, most of the blood escapes, especially when the eye is kept for a short time in water ; and it then appears quite colourless both by reflected and transmitted light.

Last year, Dr. Ascherson informed me that he had seen a case of after-development of the pigment in a boy three years old. This child had at his birth white hair and violet coloured eyes, with dark red pupils : at the end of the third year, its hair was light brown and its eyes were blue ; but they had still in a remarkable degree, though less so than before, that restlessness peculiar to the eyes of Albinos. This was the only case of the kind I had ever heard of, except that communicated by Michaelis, in Blumenbach's *Medicinische Bibliothek*, vol. iii. p. 679 ; which, however, rests only on the uncertain authority of some peasants. Singularly enough, I had soon after the good fortune to meet with a similar case myself. In my younger days, there were two children, a brother and a sister, living near me, who presented such striking symptoms of leucosis in their eyes, hair, and skin, that they were recognised as Albinos even by non-medical persons. My attention was lately drawn to them by an advertisement I saw in the papers, in which their name occurred, and I learned that the brother had become a tobacconist ; but, to my great astonishment, on going to see him, I found that his eyes had changed from violet to grey, and his hair from white to light brown, and that the susceptibility of the eyes to the light had greatly diminished. There is a circumstance in some degree analogous to this subsequent development of the pigment of the eye, which, though much less striking, is of frequent occurrence ; namely, that in children born with grey or blue eyes, they gradually become brown before the expiration of the first or second year. How far Rudolphi's statement is correct, that the secretion of the pigment of the eye is more copious in youth (than in middle age) I am not prepared to say. Desmoulins also maintains that the pigment of the eyes diminishes in old people, as is notoriously the case with that of the hair.—*Medicinische Zeitung*.

Congenital Cervical Fistulæ, (the remains of the branchial fissures.)—Since attention has been drawn to them by Dr. Ascherson, they can scarcely be said to be of rare occurrence, since slight traces of them at least are to be found in almost the greater proportion of subjects. It is remarkable that a few years after Dr. Ascherson had first become acquainted with this malformation, a French writer very in-

correctly described a case of it as a *salivary fistula*. (*Gazette Med.* 16 June, 1832, p. 339.) A case also lately came to my knowledge in which a fistula of the same nature, but with its external orifice closed, had for a year and a half assumed the appearance of an enlarged lymphatic gland, and been considered as such by several practitioners, until its real nature was discovered by its opening externally.—*Ibid.*

ANATOMY AND PHYSIOLOGY.

The Lymphatic System in Reptiles.—Professor Müller, of Berlin, while engaged in a course of experiments on the lymphatic system, has made some very interesting observations on the causes which propel the lymph, in the lower types of vertebral animals. He discovered in the frog, at the posterior part of the femoro-iliac articulation near the anus, an organ which is the seat of contractions and dilatations, and which appears to exert a great influence on the motion of the lymph: this organ is double, there being one for each thigh; its contractions are neither synchronous with those of the heart, nor of the respiratory organs, nor are the motions of the organs of both thighs synchronous. This organ is a sort of vessel, containing a colourless lymph. By blowing air into it, we distend not only the whole lymphatic system, but also the veins. M. Müller has discovered the same organ, although with more difficulty, in toads, salamanders, and the common lizard, and he considers it as an organ for propelling the lymph towards the veins. Dr. Marshal Hull had previously discovered an organ situated in the tail of the eel, whose pulsations are independent of those of the heart. This observation induced M. Müller to repeat these observations: he found at the extremity of the tail and on each side, a pulsatory organ, containing a reddish liquid. When this organ is injected with mercury, all the lymphatic vessels of the same side are filled, while those of the opposite side remain empty.

Such are the important observations of the German anatomist; but about the same period M. Panizza, a distinguished Italian naturalist, published his researches concerning the lymphatic system of reptiles, and it is pleasing to witness the accordance of opinion between two remote and independent observers. The Italian anatomist has investigated the lymphatic system of the four grand divisions of reptiles, with the most minute attention. In some organs the lymphatic vessels are so abundant that, after a successful injection, one would be tempted to believe that the organ was entirely composed of them. They are not equally abundant in every organ; they are most numerous about the gastro-intestinal tube, rather less so in the liver, and still fewer in the ovaries and testicles. In the integuments and extremities they are almost entirely wanting.

The greater number of lymphatic vessels terminate in the recep-

tacle, or in the thoracic ducts, but some empty themselves into little vesicles which terminate in secondary veins.

Of these vesicles there are four in the frog, two at the upper part of the pelvis, and two under the omoplat. They contract and dilate, but their motion is not in accordance with that of the heart or lungs, and hence M. Pauizza calls them pulsatory vesicles. They dilate to receive the lymph from the vessels, and then contract to propel it either into a vein or into the duct.—*Annales des Sciences Naturelles*.

Purulent Decomposition of the Blood, by M. Duplay.—At the post mortem examination of a woman, aged 27, who was brought in a dying state to the Hospital de la Pitié, the only account that could be obtained was, that she had been ill for some months, and had become much worse the fortnight before admission. She had dyspnoea, diarrhoea, and sweats: the following interesting lesions were discovered at the autopsy.

All the cerebral veins, without offering any trace of inflammation, contained a liquid of a faded rose colour, or yellowish grey, with purulent flakes throughout. The ventricles of the heart, but particularly the right, were distended by a liquid the colour of wine lees, in the midst of which clots and purulent flakes were suspended, the same sort of liquid was found in the pulmonary vessels, in the aorta, carotids, and jugular veins, without any appreciable lesion of their lining membrane. The lungs presented only an engorged state. In the digestive canal the large intestine alone appeared diseased, thickened, and ulcerated. The mesenteric glands were tumid and red. The arteries and mesenteric veins contained the same mixture of pus and blood contained in the other branches of the circulation. The same was the case in the veins of the liver. This viscus was very voluminous and somewhat indurated. The spleen was of enormous size, and its tissue compact: the other viscera were sound. In all the divisions of the vascular system the liquid above described was found. The articulations were not opened. Is then this curious fact, presenting no phlebitis, metritis, nor purulent cavity in any part, is it, asks the author, an example of *primitive* alteration of the blood?

Andral says, (*Clinique Med.* tom. iv. p. 683,) “Perhaps the time is not distant when we shall return to the opinion of De Haen, who admitted that in certain circumstances pus may be found in the blood, as urea is found in it in the physiological state.”—*Rev. Med.* November, 1834.

Curious Legacy.—A few days ago a lady (who had long been a prey to morbid mental affections) bequeathed to the Royal Academy of Medicine, at Paris, the sum of twenty thousand francs, left in the hands of Madame Recamier, her executrix, the interest of which is to be devoted to the foundation of an annual prize of a thousand francs, for the best memoir on the baneful influence of chagrin, in causing diseases and death. No doubt there will be many candi-

dates, and many a jaundiced essay, bearing the motto of *experto crede*.—*Ibid.*

Ball in the Lungs.—This ball had penetrated the chest above the mamma, after having broken the head of the humerus. The limb was amputated at the shoulder joint, and the patient recovered speedily from the operation, but was liable to fits of dyspnœa and frequent hæmoptysis for twenty-five years after, at the end of which period he died. The ball was found behind the third intercostal space in the midst of the pulmonary tissue, which adhered in this place to the third and fourth ribs. The cavity in which the foreign body was lodged was anfracturus, and communicated with dilated bronchial tubes.—*Ib.*

Sohmeyer on the Results of Re-vaccination in the Army during the year 1833.—The re-vaccination of the soldiers of the army and of newly entered recruits, recommended since the year 1831, has been carried on during the year 1833.

Altogether there were about 48,478 individuals vaccinated. Those who exhibited a cicatrix from former vaccination,

Distinctly amounted to,	37,286
Indistinctly,	7,641
Not at all,	3,551

The vaccinations performed at this time, after careful examination made during the usual period, were found to be

Regular in their course	15,269
Irregular,	12,203
Without effect,	21,006

The latter were again operated upon, and

With effect,	784
Without effect,	3,337

After vaccinating, which should be done with at least twenty punctures,—eight pustules were on an average obtained,

From 1 to 5 pustules,	6,586
6 to 10 do.	4,854
10 to 20 do.	3,217
21 to 30 do.	612

Of those who were vaccinated previously, and during the year 1833, with effect, there were attacked in the course of the year,

With varicella,	54
With variloid,	50
With genuine pock,	20

From this estimate it will be seen, that the army medical men undertook the task of re-vaccination with great zeal, notwithstanding that they had to combat many obstacles and difficulties, partly from the short time that the recruits who entered one division of infantry later than usual in 1833, were under the control of the medical men, and partly from a deficiency in vaccine lymph, necessary for the re-vaccination of so many persons, which in many instances, as for example in the recruits of the sixth corps, paralysed the activity of the medical officers, and prevented the extension and universality of re-vaccination which was so desirable. This want of a sufficient number of children with mature vaccine pustules, from which lymph to re-vaccinate the soldiers could be taken, obliged many surgeons not only to use dried matter preserved on bits of wood, needles, or between glasses, but to employ it after eight days had passed, and from the persons so vaccinated to re-vaccinate others.

Re-vaccination by means of old matter on covered needles or preserved between glasses, is often without effect, when in the same persons a beautiful pock may be produced, by using the lymph fresh from another pustule.

The majority of army surgeons agree, that less satisfactory results are obtained from the use of old lymph, than from the employment of recent matter, whilst some maintain that it succeeds as well.

Touching the method of operating on these re-vaccinations, whether by puncture or incision, some adopted one plan and some another, agreeing, however, in the introduction of the matter through the epidermis. The results upon the whole was about equal in both cases, though perhaps the maturation was more perfect in adults when an incision had been made.

Now and then when an incision had been made according to Eichorn's plan, and the infection took, there appeared a comparatively small pustule, the cause being probably the deficiency of lymph to supply the incision in the skin.

Concerning the consequences of the re-vaccination of the army in 1833, it appears from the foregoing statement, that in almost a third part of those who were re-vaccinated the cow-pock ran a regular course; (in the year 1831-32, this took place in more than a third of the cases.) Although when no sensible difference of susceptibility of cow-pock was perceived by the medical officers, the re-vaccinated persons might exhibit a distinct, indistinct, or no mark at all, of the former vaccination; yet this susceptibility was generally the least, when the mark was distinct. *The vaccination of such individuals was often effective even when traces were left of his previous recovery from the small-pox.*

Such cases occurred in almost every corps, but with remarkable frequency in the second corps. From among these last cases of regular cow-pock, was lymph taken, and which was effective for the vaccination and re-vaccination of other persons. In one of these cases, a child as yet unvaccinated was cut in one arm, and matter

from a soldier who had been vaccinated after having had small-pox previously, was inserted, whilst the other arm was treated with vaccine matter from a child who had not had small-pox, and the results were similar in both arms. *In a few cases, genuine cow-pock followed vaccination, where the traces of former vaccination and also of small-pox were present.*

To a certain degree in corroboration of this, there are found amongst the cases, histories of individuals who were attacked with small-pox, and who exhibited in their persons marks of a former visitation of the same disease. Ordinarily the results of the later attempts were slight in proportion to the shortness of the time which elapsed from the former attack of cow-pock, small-pox, or variloid. To this rule, however, there were several exceptions, as for instance, in a soldier who was vaccinated in 1832; in the year 1834 he was revaccinated with equal success. In another case it was repeated successfully after three weeks. The pustules produced by vaccination in most cases ran through their usual stages very regularly; now and then, however, variations were observed, in which the characteristic marks were not perceived until some days later than usual. In one case, the first insertion of matter being ineffective, a second was practised eight days afterwards, about a hand's breadth below the pit. Not only was this second successful, but the prior vaccination now took effect, and both ran their usual course together. Frequently when many pustules arose from the revaccination, the glands of the axilla swelled, and a blush of inflammation was observed upon the upper arm. This swelling of the axillary glands occurred sometimes in the false cow-pock.

When the vaccination failed, the cut exhibited very slight reaction in most cases, but sometimes there were red spots, or an inflamed knot; in the latter cases swellings of the axillary glands and fever were developed.

In a musketeer, in whom the marks of a former insertion were indistinct, and on whom re-vaccination took effect, the *rare phenomenon of a universal eruption of cow-pock was observed*, so that vaccine pustules arose not only when the matter had been inserted, but in other parts of the body, and the most distant from the insertion, resembled perfectly in form and progress those produced by the inserted matter. As an experiment, those other soldiers were vaccinated with matter taken from a pustule on the loins of this man, at a distance from the insertion of the matter, and in them regular cow-pock was developed, and from them was propagated to another by insertion.

An artillery man who was vaccinated in his youth, and re-vaccinated in the year 1833 without effect, was seized somewhat later with variloid. The eruption of thinly scattered pustules followed as usual, but somewhat more inflamed. The fever continued after the appearance of the eruption, the pock was regularly formed on the fourth day, remained the following day without change, and died off on the sixth day, leaving only one on the jaw.

The head and the chest were now attacked ; although the pulse was small, fever declared itself, and inflammation of the throat came on. *Eight days after this attack, a new crop of thirteen pustules appeared on the neck, on a spot where a blister had been applied.* In some who had been re-vaccinated without effect, the small-pox broke out the day after.

In such a case in which the small-pox appeared along with the twelve genuine cow-pock pustules, the latter remained stationary until the former had arrived at the first stage of maturation, with which it then ran equably the remainder of its course.

In one soldier the itch appeared immediately after vaccination, but appeared to exercise no influence on it, for after the usual time genuine pustules appeared, and proceeded regularly through their course.

How far the object of the re-vaccination, the prevention of small pox, was attained, the foregoing details will indicate. In about three years, among the vaccinated and re-vaccinated soldiers there have been about 70 cases of genuine and modified small-pox, and among them several who had been operated on during the year 1833. This result may, perhaps, appear unsatisfactory, and the attempted preservation ineffectual. We should take into account, however, the increasing frequency of small-pox during the latter years, especially the year 1833, when it spread nearly through the whole monarchy, compared with its occurrence, between eighteen and twenty-four years ago. Besides, in these great bodies of soldiers, there appear to be individuals who were vaccinated in their infancy, and who were attacked with natural small-pox : if, further, we consider the living together of the men, so adapted to spread the disease, the above cited results will appear so much the less surprising ; the former opinion of the absolute protection of the cowpock against the small-pox will appear overthrown by three years' experience ; nay even the small-pox itself does not protect the individual visited by it from a return.

Altogether the reports agree, that either the re-vaccination was conclusive in preventing small-pox, or that in the few cases which did occur, it appeared to be rendered milder. It should here be mentioned also, that during the year 1833, there occurred 325 cases of small-pox in the 8th corps ; 194 in the 1st ; 97 in the 2nd ; 32 in the 3rd ; and only two in the fourth quartal. This proportion offers an evident proof of the beneficial consequences of re-vaccination, for the frequency of the small-pox diminished always as the number of re-vaccinated increased ; and in the 1st quartal the number of small-pox cases was greatest, and of re-vaccinations least.

Perhaps the success of the re-vaccination would have been more general, had not the medical officers to combat against the want of fresh lymph from children, and in so many cases found it necessary to use old matter taken from vaccinated and re-vaccinated persons. As in general, the results of this process were not so favourable in appearance as when fresh matter from children was used, so it may be a question whether the cow-pock, so generated, possessed an

equally protective power against the small-pox, with that arising from the use of lymph taken fresh from the child's arm.

The experience of the next year, it is to be hoped, will contribute not only to solve this problem, but also may be able to explain with accuracy, some of the difficulties of re-vaccination above mentioned. Finally, it remains only that I mention a case in which the cure of a *nævus maternus* was partly effected by re-vaccination. It was situated on the right arm, and matter was inserted into it; two pustules arose and ran a regular course, and the *nævus* was found to have diminished one half.—*Berlin Medicinische Zeitung*, June, 1834.

PATHOLOGY AND THERAPEUTICS.

Catalepsy.—The subject of the disease is an extremely handsome female, about the age of nineteen, a resident of Rathdrum, county of Wicklow, and a married woman. About June last she came to Dublin for a severe hurt in the hip, and was at the time *enceinte*. A variety of treatment was adopted during some time she remained in Dublin, and during which time she had very bad health, loss of appetite and rest, and great dejection of spirits; but from her peculiar state, very strong or active remedies were considered inadmissible. She was unable to leave her bed; but finding herself not getting better, her friends or husband not coming to see her, she suddenly got out of bed, dressed herself and walked about, though for some days before she had been unable to do so, or even at all leave her bed; she also left the hospital, but returned to it in October last, with an increase of the disease for which she was first admitted, and during her sojourn in the country she had miscarried.

A few days after her return to the hospital she was greatly excited by the abuse of a drunken man, who spoke very harshly to her, and immediately after she got a very severe hysterical fit, which for some time returned daily, but about the ninth day she had a paroxysm of quite a different character, which was always very severe: all the muscles appeared to be firmly fixed—impossible to open either the jaws or hands—twists about her thumbs—and, should any person endeavour to hold her, she strikes at them with the greatest violence, catches at her hair, and, if not prevented, would tear it out in handfuls; she attempts to bite her own hands, and those of any person near her, and if prevented she bites the bed-clothes; her feet, if left loose, she kicks with dreadfully, in all directions. One of these paroxysms lasts but a few minutes at a time, but recur during the day very frequently, and are brought on by any slight disturbance. During the intervals she is apparently well, and in good spirits.

So far her malady may be considered of an hysteric nature, but when she was visited by the physicians on the morning of the 18th of October, it was found that a most singular and most inexplicable symptom had established itself during the night. It appears that she

had experienced in the course of the night a paroxysm of unusual duration, which had commenced by an acute "stitch" in her side. When the fit had passed away, the voice of the patient was utterly gone, and up to the time of committing this account to paper, she had not articulated a syllable. The sense of hearing, however, has remained unimpaired, and either by writing or by signs she makes it known that she understands any question which may be directed towards her. On the day after she underwent this loss of voice, the paroxysms commenced to assume a more violent aspect, and also to return with increased frequency. Soon after which change for the worse, her disease acquired for the first time all the features of a case of genuine *Catalepsy*. About a minute after the cessation of one of the fits, and when she appears to be perfectly recovered, she *suddenly* drops into what appears to be a sound sleep. The countenance is clothed with an expression of the purest placidity, the eyes are closed, and when, with a finger, the eyelids are raised, the eyeballs are seen to be rolled upwards, and the pupil dilated: she breathes quietly, and her arms, legs, and feet, though of themselves, rigidly extended, are capable of being bent without any violence, and retain whatever position they may be placed in. At first the *cataleptic* seizure occurred only after the other paroxysms, but a few days only had elapsed when it began also to precede them, and at the same time to extend itself to a greater length. On the 25th, the following was the order in which the series of very interesting symptoms exhibited themselves: the patient was in the act of making signs in reply to a question which had been put to her, when suddenly a smile overspread her face, and in an instant the cataleptic insensibility was completely established. She lay tranquilly for about fifteen minutes, when a violent paroxysm introducing itself as instantaneously as the first, interrupted her repose for about three minutes; then again the catalepsy returned, and lasting for another quarter of an hour, it left her in full possession of all her faculties except speech. She awoke, uttering a few piercing cries, which gradually subsided into a sighing moan, and then pressed her hands quickly to her left breast, as if she had pain in the direction of the heart. Another day that we saw the patient, the catalepsy lasted upwards of three hours, during all which time she lay extended and perfectly motionless; on this occasion, however, her countenance no longer presented its accustomed placidity; its veins, to their remote branches swollen with blood, and her colour became of a dark purple; her limbs stiffened into unusual rigidity, and remained so until the dark hue deserted her face, when instantly they became relaxed and pliable. Whilst entranced in the manner described music was played near her, but she seemed not in any manner to notice it: her head was then placed over a tub, and cold water was discharged upon it from a height: she screamed violently, her face became suffused, and she had a fearful fit of sobbing, but did not remain conscious. On being questioned afterwards at a moment that she was sensible, as to whether she had heard the music or felt the shock of the fluid, she replied in the negative. It has been

asserted in some medical publications, that patients in the condition of this girl, were sensible of impressions made on the epigastrium, on the soles of the feet, and on the palms of the hands: it was accordingly attempted to excite her attention, or to arouse her by directing loud sounds to those parts, but the trial did not succeed. It is remarkable, that whilst all the more striking functions of life are suspended by these attacks, the circulation never betrays any other disturbance than an inconsiderable acceleration. The features of this case enable us to understand the so called "Extacies," in which, cunning enthusiasts of several sects have represented their tools or their dupes to have been transported "as to their inward man" into the presence of the Deity, and there to have been favoured with special revelations.—*Dublin Newspaper.*

*Sketch of the Medical History of the year 1834, as observed in Hamburgh, by Dr. F. W. Oppenheim.**—The year 1834 presented many peculiarities in Hamburgh worthy of observation, but it is not easy to determine how far these peculiarities were caused by the unusual state of the weather, for which that year was remarkable. Epidemic measles, which had commenced in December, 1833, continued throughout the months of January and February, and spread most extensively in the town, few of the younger children escaping its attacks; it occasionally affected persons approaching the adult age: on the whole, its character was mild, and *it was chiefly remarkable for one circumstance, viz., that it seized several persons who most undoubtedly had measles a few years before!*

The months of March, April, and May, were on the whole healthy; in May, however, two fatal cases of Asiatic cholera occurred, and in June also two; in July four deaths from cholera took place. About the middle of August, cholera cases became more and more frequent; during that month eighteen persons died of cholera. From the 1st to the 15th of September, the number of deaths from cholera increased considerably, but after the 15th, a gradual diminution of the disease took place, so that by the middle of October, the disease had altogether ceased, its cessation having been as gradual as its invasion. The number of deaths in Hamburgh during the month of September, 1834, amounted to 448, of which 113, or more than one-fourth were caused by Asiatic cholera; there remain, therefore, 335 caused by the usual diseases. Now in the month of September, 1833, the total deaths were 319, of which fourteen were of cholera, leaving 305. In September, 1832, total deaths 412, of which 104 of cholera, leaving 308: it appears, therefore, that the cholera had no influence on the average mortality of Hamburgh, *as produced by other diseases*, which committed as nearly as possible their usual ravages, uninfluenced by the presence of the stranger! Of the 113 persons who died of cholera in September, thirteen were below, and 100 above ten years of age; of the latter, fifty were men and fifty women, and of the children eight were males and five females, so that the relative numbers of the sexes were nearly equal. The mortality seemed to

* Extract of a letter to Dr. Graves.—A translation.

be somewhat less in persons under twenty years of age, for of these only seventeen died, while there died between the ages of

20 and 30, 23 persons.
30 and 40, 23 do.
40 and 50, 22 do.

As to the length of time which the disease took before it ended in health or in recovery, an evident difference was observable at different periods of the epidemic; thus, until it reached its acme on the 15th September, it generally lasted from five to eight hours, less frequently from twelve to twenty-four, and very rarely from one to three days. After the 15th, its duration became more prolonged, and was counted more frequently in days than in hours, while the sequelæ of the disease often extended to the seventh or even the fourteenth day.

Acetate Lead in Pneumonia.—The view given by Ritscher, on inflammation of the lungs, in Rust's Mag. vol. xxxix. c. 3, has induced me also to employ against this disease the medicine recommended by him, viz., lead with opium. Although my experience in this mode of treatment is as yet very inconsiderable, yet I may place it on record as confirmatory of that of Ritscher.

The first case of inflammation of the lungs, which I treated with lead in connexion with opium, was a peasant woman, who lived two leagues from my dwelling-place. After letting of blood, I prescribed lead with opium, exactly according to the direction given by Ritscher, but I can state nothing further concerning the case, except, that the next time I saw the patient, which was not until eight days after, she was quite recovered. Much the same way it fell out with two other cases, for unfortunately in the country here, a man has to treat patients whom it is impossible to get a sight of, or who at most can be seen but once.

On the other hand, a patient who lived quite near me, and whom I saw every day some time after these, affords one more splendid addition to the cases collected by Ritscher.

A vigorous young fellow, of three and twenty years of age, was attacked after a cold, with chill, and subsequent heat, to which towards evening all the symptoms of inflammation of the chest were added, as oppression of the breathing, sharp pains in the chest, cough with bloody expectoration, headach, full and frequent pulse, (116 beats in a minute.)

The next morning I found the sick man under the appearances described, and notwithstanding existing obstruction, I administered to him, after sufficient bleeding, every three hours a table spoonful of the following medicine:

℞. Plumb. acet. gr. iv.
Tr. opii simpl. ʒss.
Aq. distil. ʒv.
Syrup. alth. ʒi.

After the sick man had taken seven spoonfuls of this medicine, (this was towards noon the following day,) the pulse was sunk to 100, and was weak, not so full as before. The pains in the chest, and the cough had considerably abated; blood was no more to be seen in the expectoration, on the other hand, a very trifling bleeding at the nose had taken place the preceding evening. The skin felt moist, and its temperature was towards yesterday much lowered. The obstruction in the bowels continued, on which account, a lavement of the usual description was administered. The medicine was continued.

The next day the pulse is almost regular; no pain in the chest; respiration free; the patient indeed still coughs, but almost without expectoration. After the lavement, dejections had been abundant. Patient had sweated a little; thirst very inconsiderable. Next day I found him almost well, sitting behind the oven. He left off all further use of medicine, (and strictly speaking, there was certainly no more indication thereto,) and some days after went back to his work. One mixtnre had sufficed for his cure.—*Medicinische Zeitung*.

Cuprum Ammoniatum in St. Vitus's Dance.—The favourable effect of this medicine on St. Vitus's dance, I had an opportunity to observe in the cases of some individuals, girls between ten and fifteen years old. I will here give the briefest possible account of the most interesting of those cases.

O. a healthy, though delicately built girl of ten years, got, without known cause, convulsion and spastic movements in the left arm, which in a few days extended themselves over the whole body, in so much, that the patient, uninterruptedly given up to an involuntary play of the muscles, was tossed about on her bed incessantly, in a agitated manner, that was horrible to behold. Delusions of sense did not take place: consciousness was present; yet the patient could not answer the questions asked her, for over the tongue also the control of the will had ceased. The pulse was frequent, hard, tight, the respiration hurried: all secretions and excretions pretty regular. In being lifted up, the patient exhibited a weightiness as of lead, only during sleep of many hours did rest come in.

As to some other patients, with whom chorea appeared as mere nervous derangement, I ordered to O. also cupr. amm., and though the enormous intensity and extent of the evil sometimes went nigh to weaken my confidence in this remedy, yet from the short duration of the suffering, I had on the other hand every hope. The patient, therefore, took, &c.

℞. Cupri sulph. amm. gr. tria.

Solve in aquæ distill. unciâ unâ.

Daily three times, twelve drops to be taken in half a cup of oat-gruel; every three days each dose to be increased three drops.

The result exceeded my expectation, for hardly had the child taken two glasses of the drops, when she was almost without any ailment, but some weakness in the left arm. The convalescent now took the medicine only twice a day, and washed the as yet unservice-

able arm with spirituous lotions. After eighteen grains of the medicine had been consumed, O. might be looked on as cured, and now, after six years, is still quite well. For the rest, as is usual in administered metalline remedies, the drops were increased until they excited illness, and thenceforward continually diminished.—*Ibid.*

Treatment of Intermittent Fever by Hunger.—Mr. M——, practising physician at Marsanissa, in Ekatorienslaw, concludes hunger to be the best remedy for intermittent fever. He recommends a strict fast of three days, and gives his patient during this time only common water to drink, without either meat or medicine. It is sometimes, though seldom, needful to premise to this course of treatment, an emetic or an aperient. All tasting of food, even in the smallest quantity, tends to hinder the effect. After the three days the patient must gradually accustom himself to food. Mr. M—— has employed this method these twenty-five years in different parts of Russia, and always found it effectual, of what kind soever the intermittent might be.

One of the cases adduced by him is very interesting. It concerns a schoolboy, fifteen years of age, who was afflicted with intermittent fever for three years with brief intervals. All means had been in vain. The patient exhibited enfarcion of the abdominal viscera in such a degree that his abdomen was like that of a pregnant woman: he had dropsy, and was very drowsy. Three days fast healed him. After half a year he was attacked with this fever again, and again was he cured by the same treatment.—*Ibid.*

Gerhard on Pneumonia of Children. (Conclusion of a paper in the American Journal.)—But one of the cases contained in the preceding table related to a child over the age of six years; seven of the twelve patients were between two and three years of age. The mean age, (exclusive of fractions,) is three years, or if fractional parts be counted, it will be between three and three and a half years. We see that there is an interval between the ages of three and seven years, in which the form of induration now described is comparatively rare, and that its most frequent occurrence is in the younger children: this statement is not applicable only to the children old enough to be admitted into the Children's Hospital, it is also true, and in a still more general way, at the Foundling Hospital, where very few autopsies are made without finding the lungs in a greater or less degree impermeable to the air.

The previous state of health was examined in all the twelve cases, and without any exception it was found to be feeble. Some of the children were affected with chronic cough, others with diarrhoea, which is very frequently the prelude to the pulmonary disease; two were admitted from other wards in the hospital, where they had been treated for chronic diseases of the skin of very long duration: not one of the cases occurred in a healthy child. On the other hand it was shewn in the first part of this memoir, that the older children who presented the ordinary form of pneumonia, were with few exceptions in perfect health at the time of its appearance, and no case was

regarded as a legitimate example of pneumonia unless the previous health of the child was perfect, or so little affected that no connexion could be traced between the chronic and the acute disease. If the same rigorous limitation were applied to the form of disease now under consideration, it is obvious that its existence as an idiopathic affection would be more than doubtful, for the cases which I have taken as examples were selected because the evidence of anterior disease was in them the least apparent : on minute examination we find, however, that even of these cases none was an original disease developed in a healthy subject, hence none could be looked upon as a strictly idiopathic affection, analogous to the pneumonia of older children. I possess many other observations of pulmonary induration which are still further removed from the character of an original disease. For in those instances no doubt existed as to the secondary nature of the affection, and it was not in accordance with rigorous induction to class them among the observations which admitted of comparison with the cases of older children affected with the ordinary form of pneumonia. The classification which I have adopted excludes all cases in which the secondary nature of the symptoms was evident, and explains in part the rarity of the disease in children older than two years, but younger than those in whom cases of ordinary pneumonia occur ; in very young children it is difficult for parents to recognize the first signs of disease, which are sufficiently obvious in older ones to make the nature of the affection perfectly clear.

The duration of the pneumonia of young children was discovered with much difficulty, *but in all cases it greatly exceeded that of older children* ; the least duration ascertained was three weeks ; in some cases it extended to several months, and became really a chronic disease. In adults, or in older children, pneumonia is never, or at least only in rare and doubtful cases, a chronic disease, but in the form of it peculiar to young children its existence seems prolonged much beyond the duration of the first mentioned variety, and it does not appear subject to any definite law. The beginning of the affection was sometimes, though very rarely abrupt ; in general the cough was at first loose, and there was little apparent difficulty of respiration ; these symptoms gradually increased, until the oppression became intense, and the respiration impeded to a degree much beyond what is ever remarked in the pneumonia of adults.

The lungs were in every case indurated in a large portion of their structure ; in no instance was the lesion confined to a single one of these organs. *This anatomical fact offers a very remarkable contrast with the pneumonia of adults*, in whom the disease but rarely extends to more than one of the lungs. The affection of both lungs was not a mere accident occurring immediately before death, the physical signs proved that both organs became diseased nearly at the same time, and in nearly the same degree. The extent in which the lungs were impermeable to air was very great in every case ; in some so small a portion of the pulmonary parenchyma remained permeable that the child must have died of the physical obstruction to the circulation

of the blood; in such cases the difficulty of the respiration was extreme. *In no case was the lung infiltrated with pus*, or in the second degree of hepatization (yellow softening;) in a single* case the hepatized portion was of a yellowish colour, but in all the induration was great, resisting more or less on pressure, and although more easily crushed than a portion of healthy lung, the tissue was always much less friable than it usually is in the pulmonary inflammation of adults. The colour as described in the detailed cases which I have given, was a bluish-red, much less intense than that of ordinary hepatization; and as mentioned in those cases, the cut surface was smooth, shining, not granulated, and yielded on pressure a whitish, slimy mucus, instead of blood or pus. The peculiar manner in which the induration takes place was evident in some of the twelve cases, but before death the lesion generally becomes so extensive that its original aspect is retained in but a small portion of the lung. In cases in which death takes place from some other lesion than that of the lungs, the original character of the disease is more evident. The induration if studied in a large number of subjects presents three distinct stages. If a lung be examined in the first stages, the greater part of the parenchyma is very soft, rosy or gray, little infiltrated with serosity or blood, and permeable; in other circumscribed parts of the lung the tissue is of a dark brown or bluish colour, very hard, and a shining, glossy aspect, very different from that of the healthy tissue. These indurations are exactly limited by the cellular tissue interposed between the lobules, and are not usually surrounded by the pulmonary tissue infiltrated with blood, and of diminished consistence: in this stage of the disease the name lobular induration is applicable to the lesion. In the second stage of induration the isolated lobules are more generally indurated; the lung if incised offers at first sight a homogeneous appearance, but an attentive inspection shows that it is marbled with small, irregular, grayish spots, from which bubbles of air can be forced by pressure; these grayish spots are portions of the pulmonary tissue, in which the vesicular structure is still distinct, but surrounded by indurated portions of lung. Some care is necessary to distinguish the presence of vesicles in the spots described; they may be mistaken for the orifices of divided bronchia, or sometimes for softened portions of the lung, but pressure on the parts will always force out some minute bubbles of air, and render their vesicular structure distinct. The third stage of induration presents the shining homogeneous appearance described in the two detailed cases; the vessels are still visible as little whitish lines, and the bronchia are compressed, but with a little care they may be readily traced. The state of the bronchia differs from that in which they are found in ordinary pneumonia; in the lesion now described, they contain some whitish mucus, very rarely yellowish, or puriform liquid; the mucous membrane retains its shining, transparent appearance, and is not often of a bright red; in no cases do I find it described as thickened. The in-

* This case was an exceptional one in several respects.

flammatory state of the bronchia is less intense therefore than in ordinary pneumonia, and is not accompanied by the secretion of the viscid, rusty-coloured liquid, which is almost characteristic of the disease in adults.

Inflammation of the pleuræ, indicated by the presence of false membranes, or a little puriform serosity, is almost always found in adult subjects dead of pneumonia; so frequently that the name pleuropneumonia was given by some writers to the disease. *In the pneumonia of young children pleurisy is rare*; of the twelve cases mentioned in the table, there were adhesions in five only; and of these adhesions some were cellular, perfectly organized, and had evidently existed a considerable time before death. When pleurisy occurs, it is therefore an exceptional case.

Four of the twelve subjects had tubercles in the lungs or bronchial glands. In one of these cases no tubercles were found in the lungs, although there were evident tuberculous deposits in the bronchial glands; this was an exception to the general rule.

I shall now examine the symptoms of lobular induration, comparing them with those of the pneumonia of adults, or what is shewn to be identical, the pneumonia of the older children, beginning with the symptoms dependent upon the thoracic organs.

Cough was a symptom in every case, but it varied in different children, and offered changes in its character, corresponding to the different periods of the disease. At first the cough was short, rather dry, it afterwards became more loose, and rather more frequent; towards the close of the disease, when a large portion of the lungs had become impermeable to the air, the cough was extremely feeble, and gradually became extinct. The voice was not altered in its character, but the breath became shorter with the progress of the induration, and both voice and cry became very difficult, and were sometimes wanting in the last days of life. Of course there was no expectoration; but when the mucus secreted in the bronchia was forced out by vomiting, it was whitish, glutinous, *but never presented the viscid or rusty-coloured sputa of pneumonia*.

The frequency of the inspirations was very great; with one exception not less than thirty-five per minute, generally from fifty to seventy, but sometimes much more frequent, and in one case amounting to more than a hundred per minute. *In one case only, the respiration was slow, never exceeding twenty*; this patient was emaciated from diarrhoea of some months standing, was tuberculous, and the extent of the pulmonary induration was not great; all these circumstances explain the apparent exception.

The physical signs of lobular pneumonia are at first limited to those dependent on the secretion of mucus into the bronchia, such as the mucous and sub-crepitous rhonchus. The sub-crepitous rhonchus frequently continued throughout the whole disease, and is never replaced by fine crepitus as in the pneumonia of adults; fine crepitant rhonchus is never heard in the pneumonia of young children; but in one or two cases at the Children's Hospital the rhonchus was rather finer than usual, and approached the ordinary crepitus. These cases

were however exceptional, and the rhonchus usually regarded as characteristic of pneumonia is scarcely found in young children. Bronchial respiration is not developed until the induration of the lung has extended to a considerable portion of the parenchyma, and then it is chiefly confined to the upper and middle portions of the posterior part of the lung; in the lower lobe it is rarely heard from the comparative smallness of the bronchia, and their prompt obliteration by the progress of the compression. In a third of the cases the bronchial respiration was not distinct, even at the close of the disease. This absence of bronchial respiration is easily intelligible; to produce this phenomenon, besides the condensation of the lung, it is necessary that the bronchia should not be obstructed, and that the air should be forced through them with a certain degree of force in the inspiration and expiration. In adults, although from the accumulation of mucus, the bronchia are sometimes obstructed, a slight effort of coughing, or even a change of position removes the impediment to the passage of the air, and the bronchial respiration is reproduced; the impetus given to the air passing through the bronchia is always sufficient to produce this sound. Young children cough more rarely, which allows the accumulation of more liquid in the bronchia; they also breathe with much less force, peculiarities which must render the bronchial respiration less distinct. There is however a character of the respiration in this affection which is almost peculiar to it; the inspiratory murmur, instead of being full and expansive as it is in healthy children, is short, obscure, blowing, and almost without the vesicular murmur; this obscure blowing inspiration may be accompanied with the mucous or sub-crepitous rhonchus, or it may be alone heard; the expiration is rarely distinct, unless the bronchial respiration is fully developed, when it is usually louder than the inspiration. This blowing respiration is described with great difficulty, but practice will render it perfectly distinct. Percussion is frequently of more utility than auscultation as a means of diagnosis in lobular pneumonia. The sound is dull on both sides of the chest, but in different degrees according to the extent of the induration; as both lungs almost invariably become indurated at the same time, the sound yielded on percussion must be compared with that afforded by a healthy chest in a child of the same age. A common source of error in the percussion of the chest in young children arises from the comparison made by the observer of one side of the thorax with the other, and as the difference of sound is frequently slight from the similar degree of induration, the erroneous inference is that the lungs are not diseased. When the induration extends to a considerable part of the lung, percussion yields a perfectly flat sound. It is always important to begin the percussion on the posterior parts of the thorax, as the anterior portions of the lung are scarcely ever diseased, and the child frequently becomes restless before the investigation is terminated. It is scarcely necessary to add that percussion should be very gentle and always mediate; for this purpose no pleximeter is so convenient as the back of the finger.

Besides the physical characters of lobular pneumonia, there are other signs not immediately connected with the functions of the tho-

racic viscera, but still caused by the difficult respiration ; these are the signs offered by the countenance, which in children furnishes an important means of diagnosis. The face is flushed, livid, or irregularly red, in rounded patches on each cheek ; the lips swollen and livid red ; the nostrils in strong dilatation at each inspiration. These symptoms occur in almost every case if the induration takes place with tolerable rapidity ; when it is extremely chronic, the want of respiration seems to accommodate itself gradually to the diminished extent of permeable parenchyma, and the dyspnoea is much less intense. In this more chronic state, the face becomes pale and emaciated, and the efforts of respiration are much less strong, although the mechanical obstacle is not really diminished.

Of the symptoms not immediately connected with the functions of the thoracic viscera, diarrhoea was the most constant. Of eleven cases in which the frequency of the dejections could be ascertained, there was diarrhoea in every case but one. The diarrhoea generally continued throughout the whole course of the disease ; in one or two cases it was present at the beginning only ; the stools were greenish and very liquid in the few cases in which they could be examined. Vomiting was rarely observed after the entrance of the children into the hospital, but frequently occurred at the beginning of the affection, especially after severe fits of coughing ; I have but few observations in which the presence or absence of this symptom is satisfactorily stated, of these cases about two-thirds were accompanied by vomiting. The frequency of diarrhoea coincided with alterations of the mucous membrane of the large intestine. The thirst was always great. Appetite at first not impaired, but nearly destroyed when the dyspnoea became extreme, and apparently absorbed the whole attention of the children.*

The cerebral symptoms varied according to the degree of oppression and the rapidity with which the induration of the lung had taken place. When the disease proceeded quickly and assumed the characters of an acute affection, the dyspnoea was extreme, and the stupor seemed in direct relation with the oppression ; sometimes it was so intense that the children were nearly insensible to surrounding impressions. When the pneumonia was accompanied by less dyspnoea, and the disease advanced slowly, the cerebral functions were scarcely impaired.

Treatment.—The treatment pursued by the physicians of the Children's Hospital did not differ essentially from that followed in the pneumonia of older children. The antiphlogistic method was pursued, but in the cases I witnessed no blood was taken from the arm ; either scarified cups, or what is still better, leeches were applied to the thorax in numbers varying from two to eight. Even this number of leeches should be applied with some caution, as the loss of blood from their bites is sometimes very great. External revulsion by sinapisms, poultices, or blisters, was frequently used, and small doses of

* The preceding pages might have been increased by an analysis of the anatomical lesions. It is not, however, at present practicable to give a complete *et iuse* ; the points of primary interest are alone noticed.

opium with demulcents were given as internal remedies. The success of these means was so small that their analysis would scarcely lead to any results; I shall therefore reserve until the conclusion any further remarks upon the treatment.

CASE.—Paquet, a boy, aged two years, entered December 24th, 1832. Anterior health good; cough for the last eight days, and vomiting repeated on several days; diarrhoea for the last four or five days.

December 25th.—Present state. Hair light; eyes not injected; pupils natural; face generally flushed, without rounded red spots; lips rosy; nostrils dilated, in slight motion; emaciation advanced; abdomen distended, apparently tender on pressure; abundant diarrhoea; cough loose, rather frequent; respiration fifty, high, heard at a distance; pulse quick, 116; heat rather elevated; percussion sonorous; mucous and sibilant rhonchus on the left, followed by sub-crepitus when he speaks; on the right, mucous and sonorous rhonchus. Gum water; gum julep with tinct. opii. gtt. x.

On the 29th the respiration had increased in frequency to seventy per minute; cough very frequent; obscure percussion on both sides of the chest posteriorly, and on the upper posterior part of the right side bronchial respiration strongly marked both in the inspiration and expiration; inferiorly the same respiration with some mucous rhonchus; on the left side, respiration bronchial but feeble, with sub-crepitant rhonchus when he coughs. The examination of the chest became more difficult, from the increasing restlessness of the child. On the 3rd of January, mucous rhonchus on both sides; percussion still obscure on both, posteriorly. On the 8th, the percussion was sonorous on the left side, still a little obscure on the right. On the 13th, percussion sonorous on both sides; auscultation impracticable. Respiration, on the 3rd and 4th of January, from fifty to sixty per minute. On the 8th it had fallen to fifty-six, which frequency remained until the recovery of the child. The cough continued during the whole disease, and had not entirely ceased when the patient left the hospital; loose at first, but afterwards becoming harder and less frequent. Heat always moderate; pulse from 100 to 130 per minute, slower before the termination, but counted with difficulty, from the great restlessness of the child; appetite good throughout the whole disease; diarrhoea abundant at first, suspended after remaining two or three days at the hospital, and again recommencing on the return of convalescence; abdomen always distended with gas; tongue whitish, moist, rosy at the edges. The countenance offered the intense livid colour in rounded circumscribed spots on each cheek, more marked on the left than the right; this appearance continued, with some variations, during the whole disease.

The gum julep with laudanum was continued. On the 28th, a Burgundy pitch plaster was applied to the back; after the 28th the treatment was limited to the gum julep and demulcents. Milk was allowed for diet on the 31st, and a light broth on the 1st.

This case is one of the small number of observations of lobular pneumonia which have terminated in recovery. The disease was easily recognized from the bronchial respiration, cough, oppression,

and the peculiar appearance of the countenance. The symptoms were, however, much less severe than in the fatal cases. The diarrhœa was less constant and less severe than in the other cases detailed. The anterior history was not collected by myself, it was given to the house-physician on duty, and of course received without the same strict inquiry which is necessary on the part of a physician collecting a series of observations. The health of the child was said to have been good, it certainly could not have been sufficiently altered to attract the attention of the parents, but slight deviations from the healthy standard could only have been ascertained by a very rigid inquiry.

Recapitulation.—The disease termed pneumonia in adults, characterized by cough, viscous and rusty-coloured expectoration, crepitant rhonchus, bronchial respiration, and in most cases fever and dyspnoea, is observed in children above the age of six years, and is attended in them by the same group of symptoms as in adults, except the expectoration, which is often wanting. This disease is rarely fatal, is almost always limited to one lung, generally to the inferior lobe, and occurs more frequently in the right than in the left lung. The morbid appearances found on dissection of the lung, in a single autopsy, were similar in children and in adults; a deep red, granulated surface, from which a reddish, purulent liquid could be forced by moderate compression, indicating the passage between the second and third degrees of pulmonary inflammation, or between the red and yellow hepatization.

Before the age of six years, pneumonia is rarely if ever found with the same characters as in adults or the older children. It scarcely ever occurs in children in good health, so that it was impossible for me to find a single instance amongst the younger children whose parents I had interrogated with care. Instead of beginning abruptly with sudden pain and difficulty of respiration, its progress is gradual, scarcely exciting attention until a large portion of the pulmonary parenchyma has become impermeable to the air. There is always mucous and often sub-crepitant rhonchus heard in the chest, but never or scarcely ever fine crepitus. Bronchial respiration occurs in many cases at the upper and middle parts of the lung, but in some instances the alteration in the characters of the respiration is limited to a short blowing inspiration without distinct vesicular expansion, and sometimes, but not always, followed by a short loud expiration. The anatomical characters of this variety of pulmonary disease are very different from those of the pneumonia of adults. The incised surface is smooth, shining, homogeneous, with no trace of granulations, and of a bluish-red or brown colour; upon this ground are seen whitish lines, which, if examined, will be found to be the pulmonary vessels. No purulent liquid exudes from this surface, nor does it offer the reddish-yellow aspect of the third degree of pneumonia. If the purulent infiltration ever occurs, it can only be in very rare instances. The consistence of the diseased tissue is much greater than is usual in the hepatization of adults, and is sometimes so great as to offer resistance to strong pressure. The induration is at first confined to isolated lobules, which in their hardness and dark colour

offer a strong contrast to the surrounding pulmonary tissue. The extent of the pulmonary induration is sometimes much greater than it ever is in the pneumonia of adults, including nearly the whole parenchyma of the lungs. I have seen no instance in which the induration was confined to a single lung; both were always affected. The part of the lung diseased was the posterior margin, including the lower lobe and the posterior part of the upper. This portion was not separated from the healthy parenchyma by a gradual transition from the diseased to the sound tissue, but was generally bounded by a line which would pass through both lobes parallel to the axis of the body; the middle lobe of the right lung which does not extend to the posterior part of the lung, is rarely indurated. The duration of the induration was not fixed, extending sometimes to several months, and offering so great variations that no average time would faithfully represent the duration of the disease.

The name pneumonia is commonly applied to the two forms of disease which we have investigated; these varieties are generally looked upon as so identical, that an eminent physician of the Children's Hospital has stated that few children die without pneumonia to a greater or less extent. There are however so many points of difference between the two affections, that it is at present illogical to regard them as identical. The first variety appears to be an ordinary inflammation of the lung, the second offers much greater analogy with the mechanical obstruction to the circulation of the blood through the lungs, which often occurs in old age: this opinion is corroborated by the fact of its occurrence, only as a secondary lesion in patients enfeebled by disease, and at the posterior parts of the lungs where the blood has a natural tendency to accumulate when the physiological powers are deficient. The lesion known by the name of pneumonia of young children is, therefore, not similar to the idiopathic inflammation of the lungs, but is a mere secondary lesion occurring during the course of numerous affections of childhood, especially bronchitis, measles, and chronic diarrhoea, and should be described as the lobular induration of the lungs.

The treatment which was pursued was similar to that employed in the pneumonia of older children; but the depletory measures seem peculiarly adapted for the very commencement of the affection, to diminish the quantity of blood passing through the lungs. Opiates were much employed, but the advantages derived from them are very problematical. After blood-letting the use of revulsives on the part affected, or still better over the whole cutaneous surface, offers the greatest probability of advantage. In chronic cases no revulsive is superior to the sulphur bath, made by dissolving one to four ounces of the sulphuret of potassa, according to the strength of the child in an ordinary bath; care should be taken not to prolong the bath if the child appears exhausted, and not to expose the face to the vapour from the sulphur. The treatment presents many questions for investigation, the present inquiry was necessarily directed to those points of the natural history of the disease which could be studied with more accuracy than the treatment at the Children's Hospital. If the pathology of the affection has been rendered less obscure, the

operation of therapeutic means can be traced with sufficient precision to estimate their value.

Gastric Neuralgia.—A very distressing case of this kind lately came to our knowledge, which cannot fail to be interesting to many of our readers. A gentleman of high intellectual attainments, and one of the most successful authors of the day, had suffered most severely, for nine months, with an agonizing pain in the region of the stomach, which came on every day at breakfast time, whatever he ate, or whether he took food or not—and continued without intermission, but accompanied by the most distressing flatulence, till he had finished his dinner and taken a bottle of wine. It then ceased, and he was perfectly well, and in good spirits, the whole of the evening. He also slept soundly, except when kept awake by an anticipation of the pains which he was to undergo the next morning. The nature of the food made no difference; nor did an alteration of the hour of dining alter the period of the gastralgia. If he dined at his long-accustomed hour—six o'clock, and took a bottle of port-wine, his temporary security against the enemy was certain. An anticipation of the dinner-hour did not bring with it the relief expected. It may well be supposed, that a gentleman in his rank of life had had the best advice, and tried a variety of remedies. He resided in the country, and had never been our patient. He wrote a most pathetic letter, describing his sufferings, and imploring, for the sake of humanity, that we would suggest something for his relief. We prescribed the following:—

(No. 1—*Aperient.*)

℞. Decoct. aloës c. ℥iv.
 Carb. sodæ, ℥j.
 Carb. ammonia, ℥j.
 Tinct. sennæ c.
 Tinct. rhei comp. āā ℥ss.
 Vini colchici. ℥ij.

Misce fiat mistura, cujus capiat coch. ij. mag. primo mane, cum paullo aquæ tepidæ, et repr. dosis omni horâ donec alvus plene respondiat.

After the operation of the aperient, he was desired to take a table-spoonful of the following mixture every hour, till the pain ceased, or until the bottle was finished.

(No. 2—*Anodyne.*)

℞. Confect. aromat. ℥ij.
 Carb. ammon. ℥ss.
 Tinct. card. comp. ℥ss.
 Liq. opii sed. ℥j.

Aquæ cinnamon. ℥ij. Misce ut supra capienda.

We did not deem it prudent to alter his diet, as regimen seemed to have no influence on the complaint. We desired him, however, to change port-wine for brandy and water. We heard nothing of him for three weeks or more, when we received a letter, containing the following report.

“ ——— *Park, Nov. 10th, 1834.*

“Dear Sir,—I ought long ago to have thanked you for your prompt and skilful attention to my distressing case; but waited till I could speak with certainty as to the success of your prescriptions. I have the pleasure to say that I am completely, or very nearly so, relieved from the flatulence, which was more difficult to bear than the pain. This relief I mainly attribute to your *warm aperient*, which I have taken every morning. I had got some temporary ease from the paroxysms of pain I described, by a strong dose of morphia and strychnine, before your prescriptions arrived. It kept me dozing and sick for nearly forty-eight hours. I then took your aperient medicine, and it has been so effectual, that I am nearly myself again—certainly a very different creature from what I was three weeks ago. I have changed my port-wine for brandy and water, and enjoy my breakfast once more. I have not had occasion to take the anodyne marked No. 2 at all. I shall soon be in town to thank you in person for the great benefit I have derived from your able assistance.”

The relief above described may or may not be permanent; but, even if temporary, it is of no small advantage. We desired him to strike out the colchium, and persevere with the warm aperient. The gentleman is nearly seventy years of age, and of a very florid complexion, and, we, believe, of gouty diathesis. We had never seen him but once, and that more than eighteen months previously to his application to us—when, in consequence of some official duties which we had to perform, this gentleman was somewhat incensed against us. This gastralgia was of a remarkable character, and we think it was occasioned partly by flatus, and partly by some acrid secretion in the stomach itself. The regular periodicity of the attack, however, and the relief experienced by dinner and a bottle of wine, shew that the nerves were deeply implicated. Should we learn any more of this curious case, we shall state it to our readers.

Case of Ununited Fracture cured by Friction and Pressure.—In a late number of this Journal, we noticed some remarks of Sir Benjamin Brodie's on the treatment of ununited fracture. Those remarks were founded on a case of ununited fracture of the tibia, for which Sir B. Brodie employed the seton. The present fact may be added to the collection at which that eminent surgeon glanced. It is related in the number of the American Journal of the Medical Sciences for August of this year, by the gentlemen under whose notice it occurred—Dr. Parrish, jun., of Philadelphia.

CASE.—An athletic man, aged twenty-seven, fractured the left humerus in March, 1833. He immediately applied to a surgeon in a neighbouring town, who carefully adjusted the fragments, and placed the limb in splints; the injured parts being but slightly painful, the first dressings were allowed to remain undisturbed for about three weeks, when other splints were substituted, and continued on the limb, with occasional alterations, for three months. At the end of this period, finding no improvement, his physician advised him to seek further advice.

On removing the splints, the limb was found to be much reduced in size, its muscular power was obliterated, and its capillary circulation feeble. He was advised to lay aside the splints and bandages, to use the limb moderately, and to keep up a steady state of external frictions. This plan was pursued till the Autumn, when no amendment was perceptible, and he placed himself under the care of Dr. Parrish and Dr. William Ashmead. The following was then his state.

“On a careful examination of the parts, we found an unusual obliquity in the fractured portions, the surfaces exposed being not less than three inches in extent, the edges of these surfaces, the rounded extremities of the fragments, and the crevices separating the opposing surfaces of the fracture, could be distinctly traced by the fingers. This examination was rendered peculiarly satisfactory in consequence of the emaciation and flaccidity of the limb.

“Owing to the remarkable extent of the fracture, and the loss of muscular power in the arm, the fragments, which in a more vigorous state of the surrounding parts, might have been kept in apposition, were separated from each other to a greater or less extent, as they were influenced by the position of the limb. When the fore-arm was flexed upon the arm in the usual attitude for fractured humerus, the surfaces of the fragment were separated throughout their whole extent, but more particularly at their upper portion—and it was only in one position that their apposition was effected.

“The limb being placed in that position which we found upon trial effected a perfect coaptation of the parts, the upper and lower portions of the broken bone were grasped by the hands, and a firm, gliding motion communicated, so that the surfaces could be felt rubbing upon each other. This process was continued for several minutes, and the limb was then secured in this position by light dressings in an angular box, a piece of thin board being firmly bound over the seat of fracture.

“This process was repeated for several successive mornings, and was performed by Dr. Ashmead or myself: the few first trials excited but little sensation in the fractured surfaces, though the force used was as great as we could command. In a few days, however, the patient began to feel pain, which increased at every repetition of the process, until it became acute. The fractured ends were less moveable, heat and action were re-established in the limb, and we were obliged to diminish the frequency and severity of the friction.

“In about a month, a bony union became evident at the lower extremity of the fracture which proceeded rapidly, and so agglutinated the lower portion as to prevent the necessity of the box: shooting pains were frequently experienced in the limb, and any attempt to disturb it produced considerable suffering. Under these circumstances, we declined interfering with the salutary operations of Nature, which proceeded most happily. In about two months after the commencement of the practice, we had the satisfaction of observing, that a firm bed of callus was thrown out over the whole surface of this extensive fracture.

“The muscles soon acquired their accustomed volume and force, and the man has since been pursuing his laborious occupation.”—*Medico-Chirurgical Review.*

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PART I.
ORIGINAL COMMUNICATIONS.

ART. IX.—*Pathological Observations on the Organs of Circulation.* By ROBERT LAW, A. M., M. B., Fellow of the King and Queen's College of Physicians in Ireland, Physician in Ordinary to Sir P. Dun's Hospital, &c. &c.

HYDROPS PERICARDII: HYDROTHORAX: ASCITES: AND ANASARCA.

JOHN CAMPBELL, aged 19, servant, of a naturally strong constitution, and of regular habits, was admitted into hospital May the 1st, exhibiting the following phenomena: œdema of legs and feet; fulness of the abdomen with distinct fluctuation: the liver is felt considerably below the margin of the ribs. Percussion yields a clear sound in all the anterior right side of the chest, as also in anterior superior third of left side. Sound particularly dull in præcordial region and even beyond it. Respiration puerile in all anterior right, and in superior third of left side; the heart alone is heard feebly pulsating in præcordial region, and in all the space corresponding to the dull sound, but not beyond this, not even under the left clavicle. The patient

being placed in the sitting posture to examine the chest posteriorly, the inferior half of each side yielded a dull sound, and complete absence of respiration. To ascertain how far these results were modified by the position of the patient during the examination, we placed him upon his hands and knees, with the body forming an inclined plane, so that the shoulders became the most dependent part. The sound now became clear where it had been dull before, and the respiration was quite distinct; pulse not frequent, weak, and small; respiration laboured and hurried; nostrils dilate. He lies on the left side; when he attempts to lie upon his back, he experiences a sensation of a weight laid upon his chest, and producing suffocation; nor does he find lying on the right side much more easy. The only positions from which he experiences no uneasiness are, either sitting up, or lying upon his left side. He has a dry, husky cough; urine scanty. We did not hesitate to decide upon the diagnosis which we have prefixed to the history of the case. The only equivocal circumstances or phenomena were, the cause of the extent of dull sound in the præcordial region, and the results of percussion and auscultation in the examination of the chest posteriorly. The change which alteration of posture produced in these latter phenomena was conclusive of their depending upon fluid effused into the pleuræ. We had now to account for the extensive dull sound in the præcordial region; we concluded this to depend either upon extensive dilatation of the heart, or upon equally extensive effusion into the pericardium. We ought to have remarked before, that the account Campbell gave of himself was, that he had had the influenza a month before we saw him, and not finding himself recovering his strength, and perceiving his legs and feet to swell, he was induced to seek admission into hospital. Up to the period of his being attacked with the influenza, he had enjoyed perfect health. A dilatation of the heart, commensurate with the extent of the dull sound, would have required more time to develope itself, than consisted with the history of this case. Besides the ordinary pa-

thognomonic signs of dilated heart were wanting, viz. extension of sound beyond the præcordial limits, the sound here being strictly confined within the space which yielded the dull sound on percussion ; nor had he the characteristic sharp, short, loud first sound, but a weak, feeble action of the heart, evidently more remote from the surface than natural. For these reasons, in addition to the coexistence of effusion into the other serous cavities, we concluded the dull sound was the measure of effusion into the pericardium. The indications of cure were obvious ; mercury and diuretics were principally employed ; he amended, but very slowly : according as the ascites diminished, we were enabled to appreciate the enlargement of the liver. Occasionally, when the dropsical swellings were at their highest, he complained of pain of the head, and sickness of stomach, symptoms which we always regarded with alarm, dreading the extension of the dropsical tendency, which had exhibited itself in the other serous membranes, to the arachnoid. His most constant complaint was of a sense of “ squeezing ” at his heart. Although his improvement was slow, it was progressive till July the 11th, when he was seized with weakness, langour, and depression of spirits ; on the next day the lower part of the abdomen and the thighs were covered with an efflorescence of purpura hemorrhagica ; some of the spots were of a bright red, others were of a deep purple colour ; the gums at the same time exhibited a soft sponginess. Quinine and porter were directed for him. In four days, the efflorescence had completely disappeared, and the plan of treatment which we had been before pursuing was resumed, adding to it something of a tonic character, which the recent complication seemed to demand. The diminution of the effusion in the different situations was now very palpable ; he began to lose the bloated appearance he had hitherto presented ; the integuments of the chest no longer exhibited the circular depression which the applied stethoscope produced, owing to their anasarcaous condition. The gradual return of clearness of sound and respiration to the posterior inferior region of the

chest bespoke the removal of the pleuritic effusion ; and on the 14th of October, he felt himself so much improved, that he applied for his dismissal ; on which day the following report was made : no œdema of legs or feet ; no ascites, nor anasarca ; no trace of fluid in the pleuræ ; sound still dull in præcordial region, but scarcely any inconvenience resulting from it ; he can lie down and enjoy comfortable sleep in the horizontal posture ; has no cough, and can walk quickly without any oppression of his breathing ; his general health greatly improved.

The case which we have just detailed exhibits many features of interest. We see in it a somewhat exaggerated type of the sequelæ which followed the influenza. The universality of the dropsical tendency distinguished it from almost all the other cases which we had met with. All the serous cavities seemed to have been the seats of effusion, nor would we even exempt the arachnoid. We had often observed the headach and sickness of stomach, which excited our alarm in this case, announce the participation of the serous membrane of the brain in the dropsical tendency which was at the same moment exhibiting itself in the other serous membranes. The plan of treatment which succeeded with us, was the same as we had often before successfully employed in other similar cases, viz. mercurials and diuretics, till the gums became tender ; we then laid aside the mercurial medicines, and associated diuretics and tonics. We have found a liniment composed of volatile liniment, turpentine, and tincture of cantharides, well rubbed on the abdomen and the sides of the chest, a valuable adjunct in promoting the removal of the fluid effused in the different cavities. Effusion into the pericardium seldom exhibits itself under such unequivocal characters as it did in this case. We had no less reason to congratulate ourselves on the success of our manœuvre to satisfy ourselves as to the cause of the dull sound and absent respiration posteriorly, than we had in the case which we are about to detail.

EFFUSION INTO THE PERICARDIUM AND INTO THE PLEURÆ.

Letitia Green, aged 13, while in hospital for a pain in her left shoulder and arm, was seized with scarlatina, which left behind it a dry, hard cough, and dyspnœa, so much aggravated by the recumbent posture, that she is obliged to sit up in bed night and day. While labouring under these symptoms, she was transferred to my care from the clinical ward in which she had hitherto been. She complained of most distressing palpitation of the heart; her face was bloated; eyelids swollen; lips livid; her feet were œdematous; expression of countenance was peculiarly anxious; pulse 96 in the minute, regular, and of tolerable fulness and firmness.

Percussion anteriorly yielded a clear sound in all the right and in the superior two-thirds of left side; posteriorly the sound is clear in the superior two-thirds, and dull in the inferior third of each side. In the præcordial region, or the anterior inferior left third, there is palpable fulness and dullness of sound. Although the respiration is distinct in all points when the sound is clear, still it has a peculiar short, abrupt character, as if the vesicular structure of the lung could not expand itself, or open for the reception of the air. When the sound posteriorly was dull, respiration was absent; but these phenomena disappeared on change of posture. On placing the patient on her hands and knees, with the body sloping, clearness of sound and distinct respiration took their place. We thus had the assurance, that it was upon fluid effused into the pleuræ they depended, and that this fluid was not prevented by adhesion from obeying the laws of gravitation.

In the præcordial region occupying the inferior third of left side, and inferior third of sternum, the heart beats with a strong impulse and with a marked bruit de soufflet. This bruit is most distinct at the left side. We confess, that the part of our diagnosis which regarded the lesion of the heart, especially the

cause of the bruit de soufflet, was divided between two opinions. The next case to which we shall advert is one of pericarditis, in which the bruit de frottement passed into the bruit de soufflet; which being fresh in our mind, and being aware of the frequent coincidence of scarlatina and pericarditis, we inclined to the opinion, that pericarditis was the lesion we had to deal with, and that the change of the phenomenon of bruit de frottement into bruit de soufflet, had taken place before the patient came under our care. The præcordial fulness, which Louis regards as a diagnostic sign of much value among the few signs of pericarditis, tended to confirm this opinion. The other explanation of the bruit, whose merits we had to consider, was a contraction of either the aortic or auriculo-ventricular opening on the left side, as the bruit was so much more distinct at this side. No derangement of the circulation having been known to exist before the present illness, was strong evidence against this explanation. The age of the individual rendered it unlikely that the aortic valves should be diseased. The reasons which militated against the narrowing of the auriculo-ventricular opening were, the full pulse, (the pulse being almost invariably small, and this for obvious reasons, in this lesion), and there never having been a trace of hæmoptysis, which generally exhibits itself at a very early period of this disease. (*Diagnosis*:—effusion into the cavity of each pleura; and into the pericardium, the result of pericarditis.) Her cough was extremely harassing.

℞ Misturæ Camphor. ℥v.
 Aquæ Laurocerasi ℥iss.
 Tinctur. Digitalis gutt. xxx.
 Tinctur. Scillæ ℥s.
 Syrupi Tolutani ℥v. ʒ.
 Sumat ℥i. tertiis horis.
 ℞ Extract. Hyoscyami gr. iss.
 Pulv. Rad. Scillæ,
 Pulv. Ipecacuanhæ, ā. gr. ss.
 Fiat pilula, ter die sumenda.

Linimentum, e Linimenti Volatilis ℥iij., Olei Terebinthini, 3vi.,
Tinctur. Cantharidum, 3ij., pectori infricandum.

She continued to take these medicines from May 25th till June 9th, when we made the following report: countenance much improved; swellings of face and feet have disappeared; she can now lie down in bed; cough, if not entirely gone, gives her no uneasiness; pulse 54 in the minute; præcordial region still presents a palpable fulness; the *bruit musical*, exactly resembling the chirping of a young bird, has taken the place of the *ci-devant* bruit de soufflet; the dull sound and absent respiration posteriorly occupy much less extent. The respiration through the entire chest seems very much hurried when examined with the stethoscope, but there is no dilatation of the nostrils, nor do her own sensations bespeak any dyspnœa.

Omitte* pil. et Mistur. Camphor. c. Tinctur. Digitalis.

R Decocti Cinchonæ ℥v.

Tinctur. Scillæ 3i.

Syrupi Aurantii 3vij.

Misce. Sumat 3i. ter die. Potus Bitartratis Potassæ.

June 16. Pulse 84, full, firm, and regular; bruit musical, very distinct; on examining the posterior region of the chest we heard as distinct bruit de soufflet through all this region, as we had ever heard it under its most striking and unequivocal character in the præcordial region; it prevented us hearing the respiration. It occurred to us to make the patient suspend her breath for a few moments, which when she did, the phenomenon completely disappeared. We directed the attention of several experienced stethoscopists to the case, and after they had made their examination, asked their opinion as to the sound and its cause. All regarded it as an unequivocal bruit de soufflet, dependent upon an affection of the heart. Their surprise was

* The impression made upon the pulse made us discontinue the digitalis.

great when they found that stopping the respiration caused it to vanish. We have here an interesting example of the manner in which diagnostic signs which are usually to be depended upon, may sometimes deceive us. Had the respiration retained its physiological relation to the circulation, the error could not have been committed; but in the case in question this relation was lost, and the respiration and pulse were nearly equal in point of number. Our patient amended steadily, and found herself so well on the 10th of July, that she applied for permission to leave the hospital. Report on that day:—no bruit de soufflet, nor modification of it in the præcordial region; fulness in the region quite gone, nor does the dull sound exceed its normal limits; the respiration posteriorly still retains its peculiar resemblance to bruit de soufflet, but is heard much more inferiorly; cough quite gone; no œdema of feet even at night; she can go up stairs without feeling the least distress of breathing.

The termination of this case made me look back upon my diagnosis with complacency. The ultimate disappearance of the bruit de soufflet and of the præcordial fulness convinced me, that pericarditis terminating in effusion was the cause of these phenomena. We had seen in Campbell's case, that effusion into the pericardium, apparently independent of pericarditis, did not give rise to bruit de soufflet, whereas in the next case which we shall report, and which is an unequivocal case of pericarditis with effusion, we shall find it to be present. We at all events were satisfied, that neither disease of the aortic nor mitral valves could be the cause of the bruit, as this lesion is not so very amenable to therapeutic agency. The case suggested to us a caution, of which we never lose sight in our examinations, how the phenomena of circulation and respiration modify each other. The pupils in the hospital have often drawn our attention to either a bruit de soufflet, or some such sound in the præcordial region, which, by its disappearing on the suspension of the respiration, we have proved to depend upon

the action of the heart upon the portion of the lung interposed between this organ and the side of the chest.

PERICARDITIS FROM RHEUMATISM.

John Burke, aged 20, grocer, admitted into hospital July the 5th, labouring under a severe attack of acute rheumatism. The wrists and hands were very red, swollen, and painful. He was freely bled, and got the wine of colchicum. He was thus treated by my colleague, Dr. Osborne, under whose care he was admitted, but who being obliged to discontinue his attendance, Burke became my patient. When I saw him first, the acuteness of the attack had subsided; at my second visit, his altered expression of countenance prepared me for his complaint of having been suddenly seized, the preceding evening, with a most distressing pain under the left breast. This pain obliged him to remain in the sitting posture all night.

July 11th. *Present symptoms*; pulse 90, regular, full and strong; skin hot; respiration hurried, irregular, (*entre coupée*) and panting; heart's action apparent to the eye; percussion yields a dull sound in the præcordial region, and even beyond it, both transversely and from above downwards; elsewhere the sound is quite clear. The stethoscope, applied to the space marked by the dull sound, recognizes a violent action of the heart, but so tumultuous and confused, that the different sounds of the organ cannot be distinguished.

Venesection ad ℥xvi.

Hirudines viginti regioni cordis.

R Calomel. gr. vi.

Tartari Emetic. gr. i.

Pulv. Digitalis,

— Opii, ā gr. ij.

Cons. Ros. gr. s.

Fiant pilulæ quatuor; una tertiis horis sumenda.

Pediluvium et maniluvium cum seminibus sinapeos.

We again visited him in the evening, to see the effect of the means

employed, and if necessary to repeat the bleeding. We found him quite relieved of pain, which he said was the almost immediate effect of the bleeding; he had lost his anxious expression of countenance, and was in all respects so much better, that we saw no occasion to push depletion farther for the present.

12th. Last night's amendment continues; had some quiet sleep; blood drawn very much buffed and cupped; respiration much less hurried; heart's action recognized by the eye. The stethoscope, applied to the præcordial region, conveys a distinct sound of the friction of rough surfaces against each other (*bruit de frottement*). The sound of the heart not heard beyond the dull space, not even under left clavicle.

Repetantur pilulæ.

13th. Sleep during the night broken and disturbed; pulse 90, soft, regular; heart's action less strong, but still accompanied with a rough, dry sound, which reminded us somewhat of the crackling sound produced by the friction of the cartilaginous surfaces of a joint against each other, when the synovia is deficient; no pain in præcordial region; the joints originally affected with rheumatism, neither red, swollen, nor painful.

Repetantur pilulæ.

℞ Misturæ Camphoræ ℥v.

Aquæ Lauro Cerasi ℥iss.

Tinctur. Digitalis ℥ss.

Syrupi Croci ℥vi.

Misce. Sumat ℥i. 3tiis horis.

14th. Pulse 90, soft; heat of skin moderate; heart's action still visible. He says he feels the palpitations less. The stethoscope proves them to be less violent, and not so confused and tumultuous, but accompanied with a distinct *bruit de frottement*; respiration slightly hurried and panting; voice low and deep; has a little, short, teasing cough; sleep much more tranquil; expression much less anxious.

Repetantur medicamenta.

15th. The extent of surface over which the heart's action is discernible to the eye, is much diminished ; the bruit de frottement seems gradually to approximate to bruit de soufflet ; for the first time he complained of a sensation of weakness and faintishness, which came on at times during the night.

16th. Pulse so irregular, that it cannot be counted ; heart's action increased in violence ; skin clammy ; countenance much more anxious ; he was palpably worse in all respects than at our last visit, and on inquiring we found, that he had thrown off some of his bed-clothes during the night.

Repetantur medicamenta. Vesicatorium regioni cordis.

17th. Visible pulsation of the heart more extensive, especially towards the right side ; pulse still irregular ; bruit de frottement mixed with an occasional click ; sleep only disturbed by blister ; countenance more composed ; skin less waxy.

18th. Pulse and action of the heart very irregular ; gums becoming tender.

Emplastrum Belladonnæ regioni Cordis.

19th, 20th, 21st. Notwithstanding the continued irregularity of pulse, and heart's action, he is evidently gaining ground ; sleep not disturbed ; expression less anxious.

24th. Got up and dressed himself without any inconvenience ; the impulse of the heart less strong ; frottement less marked.

R Decocti Cinchonæ ℥v.

Tinctur. Digitalis ℥ss.

—— Scillæ ℥i.

Aquæ Lauro Cerasi ℥iss.

Syrupi Aurantii ℥v.

Misce. Sumat ℥i. 3tiis horis.

Omit other medicines.

26th. Pulse regular ; frottement nearly gone, and replaced by a distinct bruit de soufflet ; respiration natural ; sleep undisturbed ; he gradually recovers strength.

He remained three weeks in hospital after this, gradually

improving; the frottement disappeared altogether, and left in its stead, bruit de soufflet, which in time also ceased; a strong impulse took its place, to which our patient at last became insensible, although it was very obvious to the stethoscope; the dull sound in the præcordial region diminished very much. He left the hospital August the 18th, and the day previously, in order to try him, we made him walk quickly through the ward, which he did without inconvenience; we then sent him up stairs, and on his return found the heart's action very slightly increased, and the respiration scarcely hurried.

We had here an opportunity of observing the features and phenomena, which mark a case of unequivocal pericarditis *ab ovo usque ad mala*. It was interesting to observe how faithfully the sensible phenomena indicated the pathological changes according as they appeared; the dull sound on percussion, and the frottement, apprized us of the effusion of the serum into the cavity of the pericardium, as also of the hitherto smooth pericardial surfaces being rendered rough by the lymph that coated them. Then the bruit de soufflet appeared; and ultimately the strong impulse, with which he left the hospital.

The value of bruit de soufflet as a diagnostic sign is much diminished by the variety, and apparently dissimilarity of circumstances and conditions under which it exhibits itself. It was long thought that it only indicated the contraction of some orifice through which the blood passes; and experience has confirmed, that such contraction is invariably attended either by it, or by one of its modifications, bruit de râpe, or bruit de scie. Still other conditions independent of any such contraction are found, although perhaps not so frequently, to be accompanied by this phenomenon, and we believe, one of the most constant is, that which results from pericarditis, consisting in a more or less close adhesion between the laminæ of the pericardium and a consequent hypertrophy of the heart.

Dr. Thwaites, in an early number of the *Dublin Medical Journal*, records a case in which the constancy of the bruit de

soufflet induced him, and other experienced stethoscopists, to predicate a contraction of one of the orifices, but which examination after death proved to be adhesion of the pericardium, with hypertrophy. Bouillaud, who, as an authority on the pathology of the heart, is certainly *nulli secundus*, conceives, that a considerable increase in the force of the heart's pulsations is competent to produce bruit de soufflet, independent of contraction of any orifice ; and in this we have the explanation of the phenomenon in question. For hypertrophy is a constant effect of adhesion of the pericardium, and from hence is the increased force of the heart's pulsations. We conceive, the more or less close adhesion between the laminæ of the pericardium must have the effect of modifying the pulsations of the heart and its sounds ; and in Burke's case, in the early stage, when the frottement was most distinct, the heart's action, apparent to the eye, was more extensive, and seemed more free and unrestrained, than after some time, when the bruit de soufflet replaced the frottement ; we conjectured that the adhesion between the pericardial laminæ might account for the change. We see from time to time a young woman, who was under our care for unequivocal pericarditis six years since. From that time she has never been free from bruit de soufflet ; and when she is excited, she says, she experiences a sensation as if two pieces of the texture designated corduroy were rubbing against each other. Except in those moments of excitement, she feels no inconvenience from palpitations, which the stethoscope always indicates. She has had no hæmoptysis, nor œdema of the feet.

The existence of bruit de soufflet, or its modifications, bruit de râpe or bruit de scie, for a long time, and so constant as to be necessarily connected with organic lesion, and yet unattended with the ordinary phenomena to which disease of the heart, sooner or later, gives rise, is with us a strong *primâ facie* evidence that it depends upon the sequelæ of pericarditis. The other lesions which produce the phenomenon interrupt the

equilibrium of the circulation, and from hence arise the distressing symptoms, which accompany them ; whereas, in the instance which we contemplate, the whole of the organ participates in the derangement, and thus no part of the circulation bears an unequal proportion.

When the souffle depends upon other lesions of the heart, than upon imperfection or disease of its valvular apparatus, we have observed that it accompanies both sounds of the organ. We thought that this circumstance might serve as a diagnostic mark ; but this we found not to be the case, at least we saw, that the souffle caused by valvular disease may equally attend both sounds ; in fact the lesion sufficiently explains why this should be the case. Experience has shown that whenever a valve is so altered as to allow the blood to regurgitate into the cavity from whence it has come, bruit de soufflet marks this reflux. It has shown also, that the same sound, or a modification of it, may, and often does, attend the friction of the blood, following its natural course, against the diseased valves. Thus when the imperfect mitral valve allows the blood to return into the auricle from whence it has come, and gives rise to a souffle corresponding to the first sound, the friction of the blood, in its normal course from the auricle into the ventricle, may also cause a souffle corresponding to the second sound ; and so in disease of the sigmoid valves, there will be the souffle of the reflux of the blood synchronous with second sound, and that of the friction of the blood against the altered valve following its natural course.

Bouillaud remarks, that the three most constant causes of bruit de soufflet are ; 1st, a great increase of the force of the heart's pulsation ; 2nd, a contraction of some point of the canal through which the column of blood passes ; 3rd, a lesion which has rendered rough and unequal a surface usually smooth, over which the blood flows. We believe these three causes apply to almost all, if not all, the cases of bruit de soufflet, and its modifications, even when this phenomenon is merely transient, and

caused by some irregularity of innervation or vital action ; we make no doubt that such irregular innervation has had the effect of producing a physical condition referrible to one of the three causes above enumerated. Thus we conceive it highly probable, that the bruit de soufflet and strong epigastric pulsation, which we so often meet with in hypronchiasis, hysteria, &c. are the results of some actual physical, although anormal condition of the aorta in this situation ; and that probably such condition consists in a narrowing of the canal of the artery, produced by some irregular action of the nerves of the coeliac plexus which here completely surround it. The nature of the phenomena must ever render their cause matter of conjecture ; examination after death has discovered no organic lesion on which they could be charged. Dr. Baillie had opportunities of examining the bodies of two persons who exhibited strong epigastric pulsation during life, and who died of other diseases ; he observes, that in both cases the aorta, the branches of the coeliac artery, and the superior mesenteric artery, were quite free from every appearance of disease. He had met with one case in which the pulsation had existed for five-and-twenty years, and in which two eminent surgeons gave their opinions that it was aneurism of the aorta, while Dr. Hunter confessed that he did not know what it was. We know of a case of a young female in whom the phenomenon supervening upon profuse hematemesis, led a most experienced and intelligent physician into the opinion, that the blood proceeded from an aneurism bursting into the stomach. The complete recovery of the patient refuted the opinion. In some cases of irritable constitution, marked by imperfect digestion and irregularity of the secretions, this pulsation will be so strong and distressing, that the patient, in the enumeration of his symptoms, will lay particular emphasis on what he terms palpitation of the heart ; its single sound easily distinguishes it from the pulsation of the heart. In the next case which we shall detail, the phenomenon appeared under such suspicious circumstances that we own it puzzled us at first.

INSUFFICIENCY OF THE AORTIC VALVES.

Timothy Loughlin, aged 38, labourer, was admitted into hospital September 24th. He had been in the service of the Ballast Board, a service which exposed him to every vicissitude of weather. A month since he felt his breathing become short, but still persisted in his employment, till five days since, when the oppression became so distressing that he could fight against it no longer.

Present symptoms:—considerable dulness of sound in the præcordial region, both transversely and from above downwards; impulse of the heart very strong, especially towards the left side; bruit de soufflet accompanies its two sounds, or rather the two sounds seem as if they were continuous, with scarcely an appreciable distinction or interval. Through all this continuous sound the bruit de soufflet was heard; occasionally, before it seemed to have reached its termination, it was broken in upon by the ventricle beginning to act *de novo*; the pulse, 84 in the minute, full, strong, and vibrating, (dicrotous,) seemed to come after the part of the sound which might be supposed to correspond to the first sound. *The pulsation of the arteries in the superior parts of the body, even the radials, distinctly visible.* He labours under a hard, dry, husky cough; respiration distinct, except in præcordial region, where it is disguised by the heart's action, and in the posterior inferior right, where it is very feeble, and where the sound is dull; when he lies on the left side palpitation comes on, and when on the right the cough becomes troublesome; his easiest position is the dorsal, with his shoulders raised; palpitations come on every evening about ten o'clock, and oblige him to sit up for a considerable time; complexion pale and sallow; face swollen; no œdema of legs or feet; has had frequent epistaxis.

Venesection ad $\frac{3}{4}$ x.

25th. Feels much relieved since he was bled; bruit de soufflet

heard over the whole præcordial region, but more distinct in left side.

℞ Mistur. Camphor. ℥v.

Tinctur. Digitalis ℥ss.

Aquæ Lauro Cerasi ℥iss.

Syrupi Papaveris ℥vi.

Misce. Sumat ℥i. tertiâ quâque horâ.

29th. Has been tolerably easy for some days, but now complains of distressing palpitation, and increase of oppression; respiration very feeble in posterior right side.

Emplastrum Belladonnæ regioni Cordis. Addatur Misturæ Tartari Emetici granum.

October 4th. His condition improved so much, that he left hospital, but returned on the 20th, with all his symptoms very much aggravated. The heart's action so strong as to make almost the entire body to vibrate; the dyspnœa so distressing as to prevent him lying down in bed; the stethoscopic phenomena the same as before, only much more distinctly pronounced; pulse retains its full, jerky, vibrating character; his voice is low and stifled; no œdema of feet and legs.

Venesection ad ℥x.

℞ Plumbi Acetatis gr. iv.

Opii puri gr. ij.

Conser. Ros. q. s.

Fiant Pilulæ quatuor. Sumat unam quartâ quâque horâ.

℞ Mistur. Camphoræ ℥v.

Tinctur. Digitalis gutts. xxx.

Aquæ Lauro Cerasi ℥iss.

Syrupi. Papaveris ℥vi.

Misce. Sumat ℥i. tertiis horis.

24th. Crepitus in right lung posteriorly; when he lies on left side, cough and wheezing become very distressing; pulse retains its vibrating character, but is more feeble.

Addatur Misturæ Liquoris Tartari Emetic ℥ss.

28th. Complains much of oppression of his breathing.

Venesection ad 3viiij.

The daily changes were so insignificant, that we did not think it worth while to notice them. He was so sensible of the relief afforded him by bleeding in the distressing attacks of dyspnœa which came on from time to time, that he has often solicited its repetition. After being a month in hospital, we recognized a difference in the stethoscopic phenomena; the bruit de soufflet remained in *statu quo*, but after the second sound there was a distinct bruit musical; this phenomenon was one day present, and perhaps absent the next, nor were we able to say, that its absence or presence in any way modified the other symptoms. Whatever pain he suffered he referred it to behind the ensiform cartilage, and leeches applied here, not only relieved the pain, but produced a marked amendment in his other symptoms; however, these improvements were not of long duration; the paroxysms of dyspnœa were at times so distressing as to drive him out of bed; in their intervals he was comparatively easy; he had repeated attacks of epistaxis; his complexion became more sallow and of a leaden colour.

December 4th. We recognized a strong abdominal pulsation, accompanied with a well marked bruit de soufflet; it was heard in the epigastric region behind the lower part of the sternum, the place to which he always referred his pain and uneasiness. Its single sound, and its bruit de soufflet, which was quite different in its character from that which accompanied the affection of the heart, were our security for their being independent phenomena. We own we at first thought it possible that an aneurism of the aorta might exist; but in mentioning our suspicion, we also stated that the frequency of the pulsation in this situation, and its being so often accompanied by bruit de soufflet, made us hesitate to decide before we had repeated our examination. We could discover no defined tumour, nor did he experience any pain on pressing the spine, or on either side of it; while these considerations militated against the existence of aneurism, his health

becoming deranged not only from the progress of his disease, but also from the confinement of an hospital, favoured the opinion that the phenomena were of a mere transient nervous character, and we treated them accordingly. We combined tonics with antispasmodics, improved his diet, and made him keep in the open air. At the end of a week the pulsation was very much lessened, and the bruit de soufflet had entirely disappeared. He now became impatient of remaining in hospital, and left. I ascertained that he died about a month afterwards.

There are few diseases of the heart whose diagnosis is more certain than that which consists in such an alteration of the aortic valves, as unfits them for forming a perfect septum between the left ventricle and the aorta. Dr. Corrigan was the first to give an accurate account of this particular lesion, and its specific symptoms. Experience has completely established the correctness of his account, although some difference of opinion may exist as to his *rationale*, or mode of explaining some of the phenomena. M. Guyot, of Paris, has made this lesion the subject of a thesis, in which he concurs in Dr. Corrigan's views. He enumerates four different causes, upon which the incompleteness of the valvular apparatus may depend: a fibro-cartilaginous, a cartilaginous, osseous, or petrous transformation of the entire of the valves; a partial destruction of the free border of the valves, rendering them reticular; rupture of one or more of the valves; dilatation of the aorta, which, extending to its orifice, renders the valves virtually insufficient.

The characteristic phenomena of the disease are, 1st, a bruit de soufflet of the heart, extending to the aorta, the carotid and subclavian arteries. In some cases a stethoscope placed upon the radial artery discovers its extension even here. 2nd, A visible pulsation of the arteries of the neck, head, and upper extremities. 3rd, A strong, frequent, vibrat-

ing pulse. When these phenomena meet they leave no room for doubt as to the disease.*

In some cases of profuse hemorrhage, all these phenomena will present themselves, but will cease after a certain time. The pulse peculiar to this lesion is the same as that which is denominated a hemorrhagic pulse.

There are two peculiarities connected with the disease in question, which I am not aware if they have been noticed either by Dr. Corrigan, or by M. Guyot. I allude to the much later period at which dropsical swellings come on, than in other diseases of the heart; and to the frequency of epistaxis; peculiarities easily accounted for, when we reflect upon the nature of the lesion, especially when we contrast it with disease of the mitral valve. In the latter disease the congestion, resulting not only from the difficult transmission of the blood from the auricle into the ventricle, but also from the reflux of the blood from the ventricle into the auricle, is reflected upon all the parts of the circulatory system placed behind the diseased valve, which acts like a ligature. The equilibrium of the circulation is interrupted, which is shown by the aorta being reduced to the calibre of the carotid, while all the cavities and canals behind the contracted valve exceed their normal dimensions. The results of this congestion are dropsical swellings, and frequent hemoptysis. In the disease of the sigmoid aortic valves there is a precisely opposite state of things; so far from there being any congestion, the salutary check which nature has imposed upon the impetus of the general circulation being lost in the insufficiency of the valves, the blood is impelled with unusual violence through all the circulating system, and not only sustains no remora, but being driven into the weak capil-

* The bruit de soufflet in this case, and in many others dependent upon the same lesion, reminded us of the sound produced by alternate ascent and descent of the piston in the cylinder of the steam-engine. The freuissement, or vibration, communicated to the thorax, rendered the resemblance still more striking.

lary vessels, such as those of the Schneiderian membrane, they give way, and it escaping gives rise to epistaxis. Although my experience leads me to concur in the practice of both Dr. Corrigan and M. Guyot's observations, relative to the treatment, that it should be as much as possible tonic; still the paroxysms of dyspnœa must be relieved by bleeding; and so sensible of this was the subject of the preceding case, that he often begged of me to let him be bled. We have found so much advantage from the use of digitalis, administered sparingly, as well as from other sedatives, such as camphor, laurel water, &c., that we should hesitate to proscribe them altogether. The confinement of an hospital certainly does not suit these cases; an irritability of constitution, and a general derangement of the functions, are the speedy consequences of it. We regarded the abdominal pulsation as an effect of this derangement from confinement, many other symptoms of irregular innervation exhibiting themselves at the same time.

The duration of this disease will vary in different individuals. When those in the lower ranks of life become the subjects of it, as they having no alternative but an hospital, and its consequent confinement, it runs a more rapid course with them; while with persons in more easy circumstances it may run a course of years. It is very remarkable how seldom the disease is met with in females. Every case that has come under our notice we could distinctly trace to cold as its cause.

ART. X.—*Fatal Effects of a slight Wound received in Dissection.* By CHARLES BENSON, M. D., M. R. I. A., Member of the Royal College of Surgeons in Ireland, and one of the Surgeons of the City of Dublin Hospital.

[Read before the Surgical Society of Ireland, January 17, 1835.]

ON Tuesday night, the 30th of Dec. last, I was called to see Mr. J. J., whom I had known in the school of our College as a

most laborious dissecting pupil. I saw him a few days before, and he appeared to be in high health. His complexion was florid, his temperament sanguineous; this was his first season as a dissector, and he was twenty-two years of age. His brother, also a student in the College, told me on our way to him, that the patient laboured under fever, and was anxious and desponding to a degree which the symptoms did not appear to justify.

I found Mr. J. in a very confined room, complaining of excruciating pain in the head, his eyes suffused, his face flushed, the tongue covered with thick yellow mucus, his skin hot and dry, and his pulse above a hundred and somewhat hard. I learned that he was perfectly well on the preceding Saturday, and spent the day, as usual, in the dissecting-room. On Sunday morning he felt a little unwell; however he got up and ate a hearty breakfast, but soon after complained of headach, shivering, pain in the back, and sick stomach. He vomited immediately after, and was obliged to go to bed, from which he had not since stirred. His bowels had been freely opened by purgatives; the discharges were dark and offensive, the urine scanty and high-coloured.

This young man appeared to me to have taken the fever so common among students in the first months of their anatomical pursuits: a fever occasioned by sudden changes of temperature, by sitting in wet clothes at lecture, &c., and by the absence of the pure air and domestic comforts, which they enjoyed in the country, and at home. I took some blood from his arm, and had his bowels acted on by mercurial and saline purgatives. Next day (Wednesday) I found the symptoms rather worse, he was more anxious and desponding, the tongue more dark, the pulse more frequent, not so hard. The headach was diminished, but he slept none. He had an uncomfortable sense of fulness in the abdomen, though the alvine evacuations were sufficiently copious. He urged me to bleed him again, but as the blood which had been drawn exhibited no inflamma-

tory appearance, I hesitated. The respiration was quite natural; he had no cough; the abdomen was soft, and free from pain on pressure; no symptom indicated general bleeding. As the headach was not quite gone, I recommended some leeches to the temples, a diaphoretic mixture during the day, and five grains of calomel at night. But the relief he had already experienced from bleeding induced him to have recourse to it again, and a few ounces of blood were taken from his arm.

Thursday. He passed a wretched night, sleepless and unhappy, sometimes delirious. The head was free from pain, but giddy and confused; pulse 120; tongue brown; skin and discharges as before. The characters of the fever were now such as to make me uneasy. I questioned his brother minutely as to the causes to which he had been exposed, and as to his previous history. It was then, for the first time, he mentioned that the patient had a slight scratch on one of his fingers, (right hand), and some tenderness on pressing the right side, but as there were no red lines between, and as the scratch was healed up, he said he could not consider that it had any connexion with the existing symptoms. I examined the finger; it presented a little wound, not more than one-fourth of an inch long, such as a spiculum of bone might have occasioned, and was nearly healed. The arm and forearm had no discoloration, neither did he experience pain when they were pressed, but pressure below the axilla, on the pectoral muscle, and about the clavicle, excited expressions of intense suffering. These parts were considerably swollen, yet free from discoloration; neither did they pit on pressure. They were also free from vesications and those little elevations, like cicatrices, which often attend upon dissecting wounds. The symptoms of the fever, however, the sleepless nights, the despondency, the local tenderness, and the rapid pulse, coupled with the existence of the little wound, could scarcely leave a doubt as to the nature of the case on the mind of any one who had read Dr. Colles' papers in the Dublin Hospital Reports.

I had the side stuped with decoction of poppy heads, camphor mixture with ammonia given him during the day, and five grains of calomel at night.

Next morning (Friday) the symptoms generally had become worse, but his side was less painful. The stupes had afforded him great comfort. The feeling of distention in the abdomen made him anxious to be purged, yet the abdomen was soft enough to the touch, and his bowels had been freely acted on all along.

On looking at the finger now I found a vesicle of an oval form, flattened, and nearly empty, as if it had been burst. The little wound lay exactly in its major axis. It contained a very small quantity of whey-coloured fluid. There was no unusual appearance in the arm or forearm, nor did the wound made by venesection at the bend of the arm look unhealthy. He had spent the night without sleep, often delirious, but he was less desponding.

My doubts as to the nature of the disease were now removed, and I requested Dr. Colles to see him with me. We met at five o'clock, P. M. The symptoms had not changed since morning. We directed three grains of hydrarg. c. creta to be given every second hour, and agreed to meet at nine o'clock next morning.

Saturday nine o'clock, A. M. The restlessness and delirium &c., continued unaltered. The finger and arm were not changed, but the side was much more swollen, and the region of the pectoral muscle more tender. The swelling communicated no sense of fluctuation, nor did it pit on pressure. A slight blush was observable below the axilla, and here it was determined to make an incision. The knife, passed an inch deep, did not give exit to any purulent matter; it cut merely through cellular and adipose substance which was more serous than usual. A dossil of lint was placed in the wound, poultice applied, and a grain and a half of calomel ordered to be given every second hour.

At five o'clock, P. M., we again saw him. He was much

weaker ; pulse 133 ; tongue brown and dry ; skin hot and dry ; always restless, at intervals delirious. He was ordered to have the calomel only every third hour, and to take four grains of carbonate of ammonia in an ounce of camphor mixture at the same intervals ; head to be shaved ; cold lotion applied to the temples, and blister to the back of the neck.

Sunday morning, nine o'clock. We were told that he had spent a more quiet night, and was now dozing. On rousing him he recognized me, but not Mr. Colles. The tongue was less dry ; the gums a little spongy ; the skin moist, except on the legs from the knees down, which were cold and dry. He passed urine and fæces involuntarily during the night ; he complained of no pain when asked about it, but shrunk from pressure of the side as before. The lint taken from the wound had a trace of pus on it, but none could be pressed out of the opening. Ordered a little beef tea, and to have his calomel and mixture every sixth hour, instead of every third.

He was dozing and quiet all day. At three o'clock in the afternoon he expired. This was just seven days and a few hours from the time he first complained. How long after he received the wound could not be ascertained, for he knew not when or how he got it, he only knew that it was there on the Friday before his illness, and he went on, as usual, that day and the next dissecting an old half putrid subject with which he had been occupied for weeks. On Sunday he took ill, and on the following Sunday he died.

The body was examined on the following Tuesday, Dr. Colles and some medical students being present. Nothing remarkable was noticed on the exterior of the body, except the swollen state of the right side ; the swelling was greatest in the situation of the great pectoral muscle. On raising the integuments from this muscle, the superficial fascia appeared quite healthy ; the muscle, too, was free from any morbid alteration, but under it was found a considerable quantity of healthy-looking pus : the pus was not contained in a cyst ; it was not limited

by any new wall of lymph, nor by the condensation or adhesion of pre-existing structures, but it filled the cells of the cellular substance between the greater and the lesser pectorals. On pulling the great pectoral up forcibly, so as to tear the cellular tissue, this last resembled tow soaked in pus so strikingly that all present simultaneously made the comparison. How far this purulent infiltration extended could not be ascertained, as we were pledged not to disfigure the body very much.

On opening the thorax the lungs were found perfectly healthy on both sides. In the right pleura a small quantity of bloody serum existed. The heart was healthy, but the pericardium contained more serum than usual. In the head the dura mater was sound ; the cerebral layer of the arachnoid was opaque over the anterior lobes, but exhibited no mark of recent inflammation ; the substance of the cerebrum and cerebellum was every where healthy, in the ventricles, however, half an ounce of colourless serum was found, but no other sign of disease.

Mr. J. had enjoyed excellent health up to the time of his last illness, except on one occasion when the bite of a rat in the finger was followed by high inflammation of the absorbent vessels leading to the axilla, and of the glands in that cavity. His illness then was very alarming, and accompanied with severe cerebral disturbance, which may account for the thickened state of the arachnoid.

I have ventured to bring this case before the Society, because the formidable disease of which it is a specimen appears still to be but little understood ; at least many questions, as to the nature and the treatment of it, suggest themselves, to which I cannot find satisfactory answers. If the members here present would state the results of their experience, I am sure much light would be thrown on points which are now obscure. We want cases ; we want a collection of the facts which are scattered among the individuals of our profession. A single case may not be thought worth publishing, and yet I think the want of such single cases is to be regretted. In a disease which does not

often come under the observation of any one practitioner it is of importance that what each meets with should be communicated to the profession. A body of materials would thus be formed, from which safe inferences might be drawn. Much has been done by Dr. Colles, Dr. Duncan, and Mr. Travers; much yet remains to be done.

I shall make a few observations on the foregoing case for the purpose of eliciting your opinions.

That it was the same disease by which Mr. Dease and Mr. Shekleton were carried off, I think no one can doubt. The colourless swelling on the front and side of the thorax; the freedom of the wound from inflammation at first; the absence of pain, redness, or swelling in the course of the limb; the appearance of a pustule, or rather vesicle, afterwards, on the little wound; the sleeplessness, the despondency, &c., convinced Dr. Colles and me that the cases were identical. Yet there was one particular in which this case differed from them. The body under dissection was far advanced in putrefaction. It was the last remnant of an extremity with which Mr. J. had been occupied for weeks. I must confess, I was not prepared for this. All that I had read or seen of wounds received in dissection, led me to agree with the experienced writer in the *Hospital Reports*, when he says, "I do not think we have on record a well marked case of this disease having arisen from the dissection of a body in which any of the obvious signs of putrefaction were present."

As might be expected in a class consisting of 250 young men, most of them careless dissectors, scarcely a day passes without bringing under my notice some scratch, or puncture, or slight incision. When these are shown to me, my first question is as to the freshness of the subject, and, until I met the unfortunate case just detailed, I never hesitated to speak with confidence of the result if the body were many days dead. It is true, that very serious local and general symptoms often follow these wounds, howsoever received, but the *peculiar* disease, so painfully forced on our notice by the death of Mr. Dease, and Mr.

Shekleton, could not, as I thought, have its origin from a very stale subject.

The consequences of slight wounds received in the dissecting room, have presented themselves to me under a variety of forms. I have seen ;

1st. A small pustule, unattended with much pain, confined to the skin, and disappearing in a few days.

2nd. A chronic inflammation, confined to a point under the skin, causing little or no uneasiness, not suppurating, but leaving a very small hard tumor, which after remaining many months, gradually disappeared.

3rd. An erysipelatous inflammation around the wound, which slowly creeps along the finger to the hand, and remains for two or three weeks wandering about the fingers, after the wound has been quite healed.

4th. Violent inflammation of the injured part, with intense pain, followed by sloughing of the skin and cellular tissue in the immediate vicinity.

5th. Inflammation of the sheaths of the tendons, as in severe paronychia.

6th. Inflammation not confined to the part, but running along the superficial absorbents. The glands in the axilla suppurate. There is much local and constitutional suffering.

7th. The deep absorbents appear to be engaged. Some red lines may be observed on the hand ; we lose them in the arm, and again we find them in the axilla, with inflamed glands going on to suppuration ; high fever ; intense pain.

8th. Lastly, as in Mr. J.'s case, the constitutional symptoms show themselves before the local. Fever of the typhoid character. No sign of active inflammation in the wound, but a vesicle or pustule often forms on it. Absorbents not inflamed, but there is diffused inflammation and suppuration in the cellular tissue of the pectoral and axillary regions.

This last case heretofore appeared to me to depend on the absorption of a *peculiar* animal poison, generated, in some way,

at or about the time of death, and losing its specific virulence when putrefaction occurred. The others, I conceived, arose from an irritating substance of no specific nature, and assumed their different characters from the texture wounded, the irritating qualities of the matter introduced, or still more from the state of the patient's health at the time of the injury, and the peculiarities of his constitution.

We must however, with this case before us, admit, either that there is no peculiar poison giving rise to this form of disease, or that it resists the changes which, from its animal nature, we would so decidedly expect it to undergo when all around is suffering decomposition. Can symptoms such as his, so different from the other classes stated above, have their origin in a common irritant? How is it that the absorbents and their glands escape, whilst the cellular tissue at a distance, or only remotely connected, becomes so profoundly engaged? Is the active inflammation a cause or consequence of a retardation in the progress of the irritating matter. Again, as to the treatment. What plan is most likely to succeed in cases such as Mr. J.'s? is it the stimulant or the antiphlogistic? When the symptoms are fully developed, Mr. Colles thinks we must place our chief reliance on calomel; I am inclined to agree with him. Mr. J. got it freely, but he died before salivation was produced, and therefore, we cannot judge of its efficacy fairly. His gums were spongy; another day would have thrown light on it. In all cases of dissecting wounds, I advise the part to be well sucked, and then dipped in spirits of turpentine; a generous diet, and good air, from the receipt of the injury; and when a smart inflammation sets in locally, I generally consider the case will end favourably.

I shall not detain you any longer with my observations, but I beg your attention to the points brought before you, and solicit your opinions respecting them.

ART. XI.—*Some Observations on Rupture of the Uterus, with Cases.* By EDWARD WILLIAM MURPHY, A. M., M. B., Assistant, Lying-in Hospital.

THE formidable nature of rupture of the uterus, as well as the melancholy result which is generally consequent upon it, is sufficient to render it a subject of the highest importance to the practitioner in midwifery, and perhaps will be considered a sufficient apology for bringing forward opinions, which though possibly considered speculative, may be borne out by the experience of others, or at least may lead to a useful investigation.

It must excite surprise that the appalling nature of this accident did not sufficiently command the attention of the earlier and some of them highly distinguished writers in midwifery. One would scarcely suppose that a proper investigation of it would escape the vigilance of Wm. Hunter, or fail to attract the attention of the experienced Denman. But when we find both advocating as a principle non-interference, we can readily perceive how completely they supposed an occurrence so fatal to be beyond the reach of art, and consequently, from its very hopelessness, to be unworthy of attention. It is true, the latter seems to hesitate, and therefore, contradicts himself. In his essay, after very laboured reasoning, he arrives at the conclusion, "that when the uterus is ruptured in the time of labour, that both reason and experience show that the patient has a better chance of recovering by resigning the case to the natural efforts of the constitution, than by any operation or interposition of art. That if those deductions be legal, and this conclusion just in cases of ruptured uterus, it will follow, *a fortiori*, that in laceration of the vagina the patient ought not for that reason to be delivered by art." After this aphorism, in his introduction he again states, "that there is little chance of any one surviving a rupture of the uterus. It therefore *might be doubted* whether it were our duty, hopeless as the case may be and really is, to pass the hand into the uterus, to turn and deliver

by the feet, or with the forceps, or in any way the case would allow." His vacillating opinion at length seems to have been confirmed in favour of interference by the case of Dr. A. Douglass. On this case he observes, "if no other case had been recorded, this would be sufficient authority to render *it our duty* to attempt without delay to deliver the patient, and had her chance would be, to be strenuous in all the means which art dictates, to extricate her if possible from her imminent danger, and preserve the child."

A practitioner of such eminence speaking so doubtfully on one of the most essential points in practice, that of immediate interference, sufficiently proves how little was known concerning the accident, and the slight attention it received; the cause which maintained such ignorance may perhaps be readily suggested. The profession, influenced by such high authorities in the belief that nothing could be done, and that the patient was to be left to her fate, were little anxious to publish the details, and in this way many cases were altogether lost. At length unexpected recoveries gave an opportunity to publish the skill of some fortunate obstetrician; it then began to receive some consideration; even unsuccessful cases ventured before the public; and within the last few years several cases have been brought forward, (some of them instances of recovery,) which serve to throw a clearer light upon the subject, and to give the accoucheur some guide in his researches.

The causes of ruptured uterus have been variously enumerated. They are chiefly stated to be mechanical impediments in the progress of the presentation, viz. too great rigidity of the os tinæ; disproportions in the brim, cavity, and outlet of the pelvis; the linea ileo-pectinea being too sharp; the promontory of the sacrum too projecting, &c. &c. A bad position of the head, or the bones too unyielding, by which a portion of the uterus, compressed between two hard substances, is either cut, or the force of uterine action in place of dilating the os tinæ reacts upon the compressed portion as a fixed point,

and thereby lacerates it: mental agitation, frights, the projecting limbs of the child, and its too violent motions. All have been mentioned as producing it. Such an enumeration appears evidently too loose and indefinite, rather betraying an anxiety to state all kinds of causes, even the most opposite, than a disposition to investigate carefully such as most generally lead to this untoward result. The objection would be immaterial, but that the mind of the practitioner is often unjustly haunted by his fears of rupture when these causes exist, and under such apprehension may be prompted needlessly to interfere, and show an anxiety to display an adroit but ill-timed manipulation, rather than to exercise that caution and forbearance which often best proves the judgment of the accoucheur. In all cases of tedious or difficult labours (which in proportion to those of rupture are comparatively frequent) some one of these causes are generally found to exist. If then the labour be prolonged beyond the usual period, (say twenty-four hours,) the attendant becomes alarmed; he dreads the probable effect of every successive pain, and anxiously watches for the first symptom which is described as premonitory, to justify his interference; with these the patient no doubt will supply him, and in her distress will describe her pains precisely as she is asked, whether it be a tearing sensation, or cramps in the abdomen, or any other of those sensations described as preceding it. Thus, in a case where nature may be quite competent to effect her purposes, the delivery is hastened, and he is fortunate if he does not produce the very accident he was so anxious to avoid, or leave the passages in that state which will render his patient ever after miserable. These causes occur in as many cases where rupture never takes place as where it does, and therefore cannot be considered adequate to explain the effect. Mechanical impediments are the constant source of difficulty in labours with first children, and yet in such cases rupture very seldom happens. Again, if mechanical obstacles be adequate causes of rupture, it at once leads to the question, why

is not rupture of the uterus more frequent? Ought not its frequency bear a reasonably fair proportion to the frequency of its cause? And yet every practitioner must be aware how often the uterus is exposed for hours to the influence of an irregular pelvis, a rigid os tincæ, or a bad position of the head, even where the child's life has fallen a sacrifice to its action, and yet the uterus has escaped uninjured, not a single unfavourable consequence following such a labour. On the other hand, (as in some of the cases detailed,) after a labour of no unusual length, where every thing appears to proceed favourably, the attendant in momentary expectation of a successful issue, the uterus will give way, and all the alarming symptoms of rupture present themselves when least expected. It is true, that in such a case some one of the causes stated may be found to exist; nor do I mean to deny altogether their influence, but they appear to me to act in many, perhaps the majority of cases, as secondary, rather than primary. I would distinguish between their effect on the *perfectly healthy uterus*, and when its structure is previously altered. In the former mechanical difficulties are seldom followed by rupture, but in the latter instance they may readily produce it.

The pathological state of the uterus appears not as yet to receive a sufficient attention in reference to this accident; but it is probable that those researches, which are now only in their commencement, may elucidate this class of causes. Many states of the uterus have been already described, to some of which rupture of the uterus may be distinctly traced; with others, however, it is not so evident, and yet occurring as it does so much more frequently with those who have had many children, previous difficult labours, or where instruments have been used, we are led to suspect some morbid lesion consequent on previous irritation. In some of the cases given I have rather assumed than proved such a change; in others, however, there was no obscurity. The uterus was either softened in its structure, or there was a distinct thinning of its parietes.

That a slight cause will produce laceration where the uterus is in this softened state, we may learn from some cases which have been published.

Mr. Else (*Med. Gazette*, vol. ii. p. 400) gives a case of ruptured uterus at the time of quickening. Mrs. —, ætat. 20, had been married fifteen months, and until the time of conception had enjoyed tolerable health; but since that time suffered considerably from a deep-seated pain in the back and uterine region, together with symptoms threatening abortion. Before her marriage, and up to the time of conception, she had experienced an unusual degree of pain at each menstrual period, the catamenia being scanty. Her death seems to have been accelerated by an excursion to Greenwich with her husband, as shortly afterwards she was attacked by vomiting and syncope, and died in an hour. On examination after death, a rent five inches in length was found extending up from the cervix towards the anterior part of the uterus, through a portion of the placenta; the uterus was covered *with dark coloured spots, and easily lacerable*; the ovaries were diseased, one containing hydatids, the other the same dark-coloured spots as the uterus.

Dr. Sparks (*Med. Gazette*, vol. iii. p. 218) gives a case where rupture occurred apparently from a fall on the hands and knees.

A small, pale, sickly looking woman, mother of three children, her health generally bad, fell on her hands and knees, (on Oct. 15th), and at the time said she felt a distinct tearing and giving way on the inside, with a slight sanguineous discharge from the vagina. During the three following days she was restless and irritable, from an indescribable feeling of weight in the abdomen, but had no pain. On the 19th, slight uterine pains began, and continued to the 22nd; the abdomen being extremely tender on pressure. On examination, per vaginam, the lower extremities, placenta, and cord only were found in the uterus, the head and body having passed into the abdomen.

When the child was extracted it was dead and putrid. She died five hours after.

Post mortem examination.—Intense inflammation of the abdomen. The uterus of the common size; the whole fundus, posterior, and left lateral portion as firm and thick as usual; all the right dark-looking and relaxed, as thin as a sixpence in places, and transparent. A fissure, three and a half inches in extent, with ragged and sloughy edges, ran perpendicularly through its cervix, which appeared to retain its usual texture. Above the commencement, and to some extent on each side the fissure, *there were several patches of diseased structure*; the whole doubtless indicating morbid action of long continuance.

Dr. Ramsbotham, in his *Observations*, gives a case of “awfully sudden death in the last month of pregnancy,” which resembles those cases in many respects, though the existence of laceration is not stated. A lady, ætat. 20, apparently in good health, and in the midst of social enjoyment, became suddenly faint, and in a few minutes expired. The next morning the body was examined, but evidently under restraint, (being in the presence of a relative). On dividing the abdominal parietes, the gravid uterus presented itself to view, but very different as to its aspect from what is generally met with. The whole forepart of the fundus and some portion of the back part of the uterus was completely black, not unlike the appearance upon the skin of a woman after the infliction of a severe blow. The fallopian tubes were turgid and black, the ovaries of a natural size, but they had a striated or speckled appearance, somewhat like mottled soap. Upon making an incision into the peritoneal coat of the uterus, at its back part, where the black or suffused appearance was most obvious, fluid blood freely followed the knife. The cause of this hæmorrhage is not stated; but it is probable that this is only a greater extent of congestion, in softened structure, which in the preceding cases were in detached spots. These are extreme cases, but they sufficiently prove that a much slighter degree of disorganization would yield to very moderate uterine action.

It may be well to contrast these with cases recorded, in which the healthy uterus shewed an extraordinary power of resisting violence. In *Med. Chir. Transactions*, vol. xii., a case is given, in which a pregnant woman had been run over by a cart wheel; she expired immediately, and on examination after death, the uterus was found uninjured. Dr. Campbell, in a lecture on this subject, published in the 15th vol. of the *Lancet*, p. 33, states a case in which a woman in the last month of pregnancy received a severe kick from her husband in the centre of the abdomen, so as to cause a partial separation of the placenta. She died of inflammation on the third day. The uterus was perfect. These cases must also be considered as exceptions on the opposite side, but still they prove a remarkable power of resistance in the uterus, a power which we find equally manifested when it first assumes the parturient action under all the disadvantages of disproportion of parts. Of those lesions which have been described, the results of inflammation afford many to which rupture might be attributed. It occasionally attacks the unimpregnated uterus, and may be followed by partial induration. Ulcers have been found in the neck, which if healed would leave a loss of substance; small abscesses sometimes occur in its parietes. Softening of tubercles produces a similar effect. All these, if the uterus be restored to its functions, must impair its strength, and place it in a condition to be lacerated, without any very violent or long continued labour. At the period of parturition also, inflammation occurring will terminate in ulceration, gangrene softening. The latter changes are not, however, involved in the same obscurity as the former, at least the symptoms of the preceding inflammation are sufficiently evident to place the accoucheur on his guard, and to enable him to use means to counteract them, and those consequences which might follow from them. But of the former states of the uterus we can have no previous notice, nor is it until the uterus gives way in the unexpected manner it sometimes does, without any thing in the proportions of the pelvis, or violence

of the pains, to excite apprehension, that we are led to suspect some such alteration. In some cases, which I have detailed, the post mortem examination did not afford any very satisfactory evidence of the cause, but the effects of inflammation, consequent on the injury, obscured very much the real state of the uterus, and with it any lesion which might produce a thinning of its parietes. (Cases No. 1, and 2.)

It may be at once objected to an inquiry into the pathological causes of ruptured uterus, that as its morbid condition cannot be known previously, it would lead to no practical results; it would not enable us to anticipate and to prevent such an occurrence. But I would ask, can we in general anticipate and prevent rupture of the uterus? Those symptoms, which are described as premonitory, appear to me exceedingly uncertain; and if we are guided by their existence, may as often lead us to create mischief as to avoid danger. In those cases I have met, there were no distinct premonitory symptoms, on the contrary, in some of them the pains were *weak*, the passages in a favourable condition, and the labour of moderate duration; no symptom appeared which would warrant interference in its progress, or which could be considered as a forerunner of the impending mischief: comparing these with cases of difficult labour, in which the pains are strong and vigorous, but the descent of the head very slow, the passages scarcely yielding to the power of the uterus, in which, in fact, if we were influenced by portending symptoms, we would watch with alarm every succeeding pain, if not instantly attempt a delivery. When I find that in such cases labour has been completed by the natural efforts, and with perfect safety, that their recovery has been surprisingly favourable, I am naturally led to place in premonitory symptoms but little confidence. On the other hand, it appears highly important correctly to appreciate the powers of the healthy uterus; and a closer investigation of the different states in which it is found might lead us to the conclusion, that if it be unable to resist

the efforts of its own action, still less is it able to resist the violence often attendant on the use of instruments, and that in this respect the chances of *prevention* are at least equal. I cannot help quoting a passage from Baudeloque, which accords with this view of the subject. After stating those symptoms, which Levret and others gave as previous symptoms, he proceeds: "Mais ces symptomes sont trop incertains pour que nous puissions les prendre pour regle. La rupture de la matrice a en lien nombré de fois sans être precedée d'aucun d'eux et ne s'est pas fait en d'autres cas ou leur reunion sembloit annoncer *q'uelle etoit inevitable*. En les prenant pour guides souvent ou empietroit sur les droits de la nature, ou entraverait sa marche en operant un accouchement qu'elle auroit pu terminer sans inconveniens *ou avec beaucoup moins que nous ne l'eussions fait nousmemes* et l'on ne pourroit se flatter en aucun cas d'avoir prevenu la rupture dont il s'agit."

In this point of view, then, an inquiry into its pathological condition is of practical utility, if it teach the practitioner caution in infringing on nature's province, and warn him from meddling too precipitately with her operations. It may also free him from the unjust imputation, that an earlier interference would have saved his patient, if he was unfortunate enough to meet with a case of this melancholy description. I cannot agree with the observations of Mr. Burns on this point, as I think them calculated (though perhaps unintentionally) to lead to this very evil. After giving very judicious directions as to the general means which should be adopted to meet and check unfavorable symptoms, he concludes: "And finally, when the pelvis is contracted, and there is any symptom indicating *risk* of laceration taking place, (*viz.* severe local pains, with a very acute tearing sensation, pains violent and frequent, which usually do not produce a great effect on the os uteri, which is *often very rigid*,) the forceps are instantly to be employed, for where such symptoms exist in any case, where the forceps are applicable, it would be criminal to delay. In more urgent cases the perforator is justi-

fiable." The forceps cannot be employed with a very rigid os tincæ ; (*vide* 2nd rule, p. 437 ;) we are, therefore, left to the perforator, in the case supposed. Am I to understand, then, that the existence of these symptoms, with a contracted pelvis, justifies the use of that instrument. The degree of contraction is not stated ; we are not, therefore, to suppose a case of *extreme disproportion*, but the average degree of irregularity met with in the pelvis, whether in the brim or the outlet, judging from the frequency of such instances in cases of difficult labour, in which the patient will describe her pain exactly as stated, I fear that if such a rule were to be acted upon, a great deal of unnecessary mischief would be committed, and the number of cases in which rupture was stated to have been *prevented*, would far exceed the average proportion, which cases where this accident occurs bear in general. If premonitory symptoms be of any use, it is in those cases in which a morbid alteration in the parietes of the uterus might be assumed ; as for instance, where a contracted pelvis has rendered the previous labours difficult, and we would dread exposing a uterus, perhaps already impaired, to the effects of violent, but ineffectual, efforts at expulsion. Here the symptoms Mr. Burns details, would be a useful warning of the threatened danger, and we would be justified in acting upon them ; but I object altogether to the applying a rule founded on a particular kind of case, to cases of contracted pelvis generally.

A knowledge of those morbid lesions, which may give rise to rupture of the uterus, appears to be valuable in this, that it will enable us to distinguish between cases of an apparently similar character, but in which interference might be either highly judicious, or positively mischievous. It may teach us also, not to consider the favourable progress of labour, or the absence of premonitory symptoms, as a security against danger, if there be anything in the previous history of the patient to excite a suspicion, as to the healthy condition of the uterus. But above all it is useful, if it save the accoucheur from the

unjust charge of ignorance or supineness in preventing an accident which no possible foresight could anticipate.

For the sake of clearness, I have arranged the cases as much as possible according to their morbid appearances. With some, I am free to admit, the direct pathological cause could not be ascertained, at the same time it must be observed, that the effects of inflammation, consequent on the injury, altered very much the condition of the uterus, and veiled its previous lesions in obscurity. In others, however, the process of softening, and its effect in causing laceration, was apparent. In one case of contracted pelvis, (Case 3,) the effect in producing partial atrophy, and consequent rupture, was readily traced; in another, gangrene, the result of neglected inflammation, (Case 8,) was observed.

Before entering on those different appearances, it may be necessary to state briefly the condition of the healthy uterus after parturition. Its size varies with the time it is examined. Within the first week or ten days, it remains above the pelvis. Its peritoneal surface has the usual shining pearl-coloured appearance of that membrane, it is firm and elastic, its section resembling that of the prostate gland; its internal surface is red and generally covered with loose coagula. At the attachment of the placenta, a number of small clots filling the open mouths of the sinuses, give it an irregular appearance presenting a raised granular surface. The fibrous arrangement of its proper structure can generally be observed through a thin albuminous layer, which may be scraped off with a scalpel. The lip of the os tincæ is irregular, livid, and occasionally puckered from fissures occurring in its margin. In the inflamed uterus the albuminous layer is increased in thickness, and becomes granular, it assumes every variety of shade from ash-gray to green, the surface looking rough, irregular, and mottled. The lymph shed on the peritoneum has the same variety of colour. When this inflammation is consequent on rupture, and a quantity of blood is effused into the abdomen, the shade of green is deepened in the

neighbourhood of the coagula, the lacerated portion is also infiltrated with blood, making the edges dark and livid; this it is necessary to distinguish from the black, ragged, and easily broken margin of softened structure. To the feel the uterus is firm, often remarkably so, but occasionally its exterior is doughy, and will retain the impression of the fingers. Such were the appearances, some of the cases I am about to detail presented, especially those who longest survived the injury; with such as lived but a short time, and that inflammation only had commenced, they were not of course so distinct. The first case I met with was a remarkable instance of the process of reparation, she lived longer than any of the others, and after death the rupture was found perfectly closed.

CASE I.—Anne Temple, ætat. 21, a healthy looking young woman, was admitted into the Lying-in Hospital, in labour of her third child. Her previous labours were reported to be favourable, and the present time, April 23rd, 1833, the os tinæ was found soft and dilatable, the head presenting with face to pubis, her pains lively. At the end of ten hours, the os uteri was fully dilated, head pressing, the waters being discharged, when she suddenly screamed and complained of an excruciating pain, unlike any she had suffered; the pain soon ceased, and all the symptoms of rupture appeared; great restlessness; hurried respiration; indistinct pulse, and a peculiarly anxious expression of countenance. She vomited nothing but bile and mucus, mixed with saliva. The foetal heart had been previously heard, it was now inaudible; she was immediately delivered by the crotchet, without much difficulty; a discharge of blood followed the expulsion of the head. The placenta was immediately withdrawn, and the hand again passed up to prevent any hernia of the intestines; a large transverse rent was found at the anterior part of the cervix uteri. She became quite faint, and the abdomen extremely tender and tympanitic. A large opiate was given in effervescence, which quieted her stomach, and procured sleep for about four hours; she was refreshed, her

countenance resumed its natural appearance ; pulse 120, weak, and unsteady ; tongue clean ; abdomen painful if pressed. She was placed under a mercurial treatment, with the frequent application of leeches, fomentations, and warm bath ; cal. gr. x. being given previously, as a purgative, to be followed by an oil draught. The tenderness of the abdomen became less ; pulse diminished in frequency, 98, but the bowels were not moved ; emollient enemata were given in addition, and she passed several serous evacuations. On the 28th, her gums became affected, the stools then were more feculent ; the abdomen was softer ; pulse 120 ; she was altogether freer from distress ; however, diarrhoea came on, accompanied with bilious vomiting. Mercury was immediately omitted, and opium, bark, cold chicken broth were given, and as she was much weakened, wine, ammonia, and other stimulants, were added. The diarrhoea received a temporary check with a most marked improvement in the symptoms : pulse 114, full ; tongue more natural ; abdomen free from pain and diminishing in size ; it again returned with uncontrollable severity, and she died May 4th, being eleven days since the rupture.

Autopsy.—The peritoneum was generally adherent, the omentum and intestines being closely united by dark green coloured lymph, giving them a mottled surface. In the left iliac and lumbar regions, a large quantity of fibrous clots, mixed with bloody serum, surrounded the uterus. The bladder, uterus, and as much as could be of the pelvic peritoneum and vagina were taken out and examined. The anterior surface of the uterus, and posterior of the bladder, were united, by which the opening in the neck was closed. The internal surface of the uterus was mottled by the same green patches as the intestines, and at its anterior part the rent was seen about two inches and a half in extent, with a thick round edge, the lining membrane of the uterus seeming to pass into it. The surface of the bladder was greatly thickened, and of a dirty green colour. It seemed as if there had been a thinning of the uterus at the rent, and

that the margin had doubled back on itself. The remainder of the abdominal viscera were healthy.

In this case the labour lasted about ten hours, the pains were strong, but not violent, the head gradually advanced to the outlet, and though it presented unfavourably, there appeared every probability of a safe delivery, the pelvis being sufficiently roomy, the only explanation of the rupture then seems to be a partial atrophy of the uterus, but which could not be ascertained distinctly, the surfaces being so closely united by lymph.

CASE II.—Mary Gore, ætat. 36, a delicate looking woman, was admitted August 31st, 1833, in labour of her eleventh child; of these seven were premature, three were born living, in two of which animation was for some time suspended. September 1st, her labour commenced, preceded by two slight rigors, the os tinæ was thin and dilatable, with an abundant mucous discharge; in four hours the membranes protruded beyond the external parts, the pains *became weak*, and the membranes remained so for three hours, when they broke. A very intelligent pupil (Mr Long) was sitting beside her, waiting the return of stronger pains, to complete the delivery, when she complained suddenly of a sharp lancinating pain, as if, to use her own words, “a sword had passed through her groin.” Symptoms of exhaustion, with a cessation of the pains, immediately succeeded, and it was evident rupture had taken place; being an hour and a half after the waters were discharged. The head was found between the ischia presenting naturally. Delivery was first attempted with the forceps, which was found impracticable, the head was then lessened, and the child slowly removed, the uterus assisting the expulsion of the breech and lower extremities. The placenta being removed from the vagina, an extensive rent was found at the anterior part of the cervix uteri. She was immediately given an opiate, which quieted her stomach, and procured a calm for two hours, when retching again returned, with restlessness; the opiate was repeated in effervescence, and as she continued watchful and restless, a grain of solid opium was

afterwards added ; she had tolerable rest during the night ; pulse 96 ; tongue clean, and countenance improved : she complained of slight shooting pains through the abdomen. She was immediately placed under the same treatment as the last case.

Leeches to the abdomen. cal. gr. ii. c. opio gr. $\frac{1}{2}$ 2^{da}. q. q. hora, and emollient enemata, to act on the bowels.

The discharges were first serous, nor did they become feculent until the gums were salivated, which took place on the fourth. The tenderness of the abdomen then diminished, but great nausea, and soon vomiting came on accompanied with feculent diarrhoea. Mercury was omitted : she was ordered the following mixture :

℞ Infusi Menthæ ℥vi.

Pulv. Ovi testæ ℥iss.

Liq. sed. gutt. xx.

To take a table spoonful every hour.

The vomiting and purging continued uncontrolled, though an additional quantity of opium was given, and on the 7th, while passing a motion, some hæmorrhage took place from the vagina, after which there was a great change for the worse ; she gradually became weaker, passing involuntary motions, and a grass green fluid flowed from her mouth without effort. She died on the 8th, 9 o'clock P. M.

Autopsy.—On opening the abdomen, a large quantity of semi-coagulated blood covered the peritonium from the umbilicus over both iliac regions, but especially the right ; the omentum, stomach, and the intestines, were all united by recent adhesions. At the anterior part of the uterus, and nearly opposite the symphysis pubis, there was a transverse rent about three inches in length, which was quite apparent when an incision was made in the posterior parietes ; the uterus was filled with clots, and semi-fluid blood, in removing which some lymph had been detached from the margin of the rent. Whatever adhesion had been formed was so easily broken, and the effused blood, and coagula so completely surrounded the rupture, that it was im-

possible to ascertain the extent of union; the internal surface of the uterus was covered by a thick layer of ash-coloured lymph, which in the neighbourhood of the rupture assumed a deep green hue. The pelvis was under size, but not irregular; the symphysis pubis did not project unusually.

In this case there was no morbid lesion to explain the accident, and the cause of rupture must be left in obscurity; the diminished size of the pelvis offers no explanation; the head passed without difficulty to the outlet, enveloped in its membranes; the uterine action was weak, and when, after the waters escaped, and the pain in some degree returned, the uterus yielded at once to them; neither was there any unusual sharpness of the linea ileo-pectinea. It was, however, sufficiently apparent, that death was consequent on hæmorrhage, which occurred subsequently to the rupture.

CASE III.—Anne Freeman was admitted August 29th, 1834, in labour of her third child. The first was reported as being born living, the second was still-born. Her labour commenced at 8 o'clock, A. M., and continued during the day with strong steady pains, the waters broke towards evening, and the head soon became fixed at the brim; the os tinæ was dilated about three inches diameter. At 10, P. M., the uterus felt very hard, as if spasmodically contracted: she said she felt something give way, and her pains, which had been strong, were exchanged for a continued spasm, rendering her restless and uneasy; there was no discharge from the vagina, and her pulse was full, it soon however, became unsteady; respiration grew laboured, with a distressing sense of tightness across the chest. She was delivered by the crotchet, with much difficulty; the pelvis being narrow, and the uterus affording no assistance. A large opiate was administered in brandy, and again repeated in three hours; however, she did not recover from the constitutional shock, and died in about thirty hours after her delivery.

Autopsy.—Here we had the first stage of peritoneal inflammation, the whole surface of the intestines being red and vas-

cular, as well as the uterus; there were very slight adhesions. When the uterus was drawn out of the pelvis a circular opening was seen at the posterior part of the cervix, nearly opposite the promontory of the sacrum, which projected, the antero-posterior diameter not being more than three and a half inches, and from the rupture a circular patch extended a short way into the body of the uterus, much thinner than the remainder; there was no other morbid alteration in any of the viscera.

CASE IV.—Mary Kelly, ætat. 36, admitted August 3d, 1834, in labour of her tenth child, of whom five were still-born. The os uteri was soft and dilatable, and the pelvis seemed sufficiently roomy. At the end of eight hours the head descended to the ischia, and there remained, making a slight advance with each pain; however they became weaker, and matters remained thus for about four hours, when on examination, the abdomen was found tender on pressure; pulse frequent (120), and weak; the bones of the head overlapped, the tumour on the head having an oedematous crepitating feel; no foetal heart could be heard. She was delivered by the crotchet of a large child, the uterus assisting the expulsion of the body and lower extremities. In a quarter of an hour the placenta was removed; the uterus contracting to its usual size. She was given tinct. opii. gutt. xl., which procured sleep for three hours, and then an enema, which acted once on her bowels; soon after she became restless, complained of the binder, which was immediately loosened. Her pulse rose to 140, weak and tremulous; countenance anxious; abdomen tender and tympanitic.

Tinct. Opii. gutt. xxx.

Spts. Ammon. Aromat. gutt. xxx.

Mist. Camph. ʒvi. was given immediately, to be repeated in two hours, if necessary.

She had some rest during the night, but towards morning she was seized with urgent retching. A grain of solid opium was given every second hour during the day, but without effect;

retching still continued, with restlessness; pulse continued very weak. She was evidently sinking, and died August 5th, at three o'clock, A. M.

Autopsy.—The intestines were crimsoned by the injected vessels; in some parts they were adherent, but the adhesions were slight. The uterus was rather pale at the fundus in comparison with the intestines. About the cervix lay some shreds of lymph, partly adherent, partly floating in some bloody serum. It had given way at the posterior part, leaving a circular opening, nearly the size of half a crown. The cervix was thin, but not softened. The body of the uterus had a soft, doughy feel; its internal surface was covered at the attachment of the placenta with loose coagula, the remainder with a layer of yellow granular-looking lymph; the antero-posterior diameter of the brim was four and a half inches, nor was there any unusual projection of the sacrum; the ischia were closer than natural.

In none of these four cases did the labour exceed twelve hours; in none were there any symptoms which could be considered premonitory. On the contrary, in Case 2, the unexpected way in which it occurred is remarkable; there could not be a more favourable labour, if we except the uterine action being weak; when it increased, after the waters were discharged, the uterus soon gave way. In Case 4, the symptoms even of rupture were obscure at first, nor was it until sometime after its occurrence that they appeared distinct. It will be seen, that the degree of contraction of the pelvis varied in each. In Case 3, there was the greatest narrowing at the brim, and of course the greatest mechanical difficulty to the passage of the child; yet the uterus did not yield until its parietes were thinned at that part opposite the projection of the sacrum. In Case 1, there was reason to suspect a similar change at the anterior part of the cervix; but the pelvis offered no obstacle to the descending head, except at the ischia, which though slight, in comparison with similar cases, was yet sufficient to cause

rupture of the uterus. Softening of the uterus was not met with in any of them, a lesion which gives rise to very different appearances. When softening takes place the uterus loses its elasticity, its parietes are easily torn, and afford but little resistance to the knife. The fibrous structure appears to soften sooner than the membranes; the peritoneum often remains entire, and is detached from the uterus, lying loosely between it and the bladder; or sometimes raised up by coagula, it forms a large dark-coloured sac, which occasionally bursts, effusing its contents into the abdomen; the fibres generally separate easily from any part of the uterus, but where they are lacerated the effused blood gives them a dark, ragged appearance. The lining membrane of the uterus communicates with the cavity sometimes by ulceration, (Case 6,) or the whole membrane over the cavity gives way, and forms one large opening. This condition of the uterus, being occasionally the result of inflammation, the distinction between it and gangrene is not easy. The general state of the uterus may be a guide. Softening is always a consequence of an unhealthy uterus, gangrene is not: gangrene is rather a local, softening a constitutional effect. Before gangrene takes place adhesion is formed, and lymph is effused in the surrounding tissues, which is not the case with softening; hence the liability of rupture is much greater in the latter than in the former instance. Direct pressure is a frequent cause of gangrene; and it is not at the time of labour, but subsequently, that its effects may be observed. When the slough separates, the uterus may be so thinned as to be lacerated in a future labour. The occasional instances in which the head of the child sloughs from pressure, (not where the tumour is formed, but in some other part in direct apposition with the pelvis,) without any apparent injury to the uterus, led me to this conclusion. It is not likely that pressure would produce gangrene and slough in the foetal head, and the uterus remain free from such an effect; there may be increased fetor in the discharges, a degree of irritative fever, with quick pulse

and furred tongue. These symptoms soon yield to treatment, but the cause still remains in obscurity. It is not until a subsequent labour that the effect may be known, (as in Case 3,) when these new formed parts, less prepared to resist the force of the uterus than the healthier fibre, give way; hence we find that rupture of the uterus seldom takes place with first children, notwithstanding all the causes which combine to retard delivery and render it difficult, and yet will occur in the same patient afterwards, although the difficulties are in a great degree diminished. But when softening becomes a consequence of inflammation occurring in the uterus during labour, the uterus will yield in the first instance. A case of this description seldom happens, because it either arises from extreme neglect on the part of the attendant, or from the imprudence and carelessness of the persons about the patient, who suffer those symptoms to proceed unchecked, and often increase them by the stimulants, which *friends* will not be persuaded to withhold. I have met with two cases (8 and 9) in which rupture occurred with first children; in one of which I had an opportunity of examining the uterus after death, and found it quite similar to the cases of softening I am about to detail.

CASE V.—*Rupture with softening.*

Elizabeth Dunne, aged 36, was admitted March 6, 1833, in labour of her tenth child. She did not appear to be at the full period; no foetal heart could be heard by the stethoscope; the os tinæ was found sufficiently open to admit the point of the finger, but she had no pains. She remained thus for nearly five days, when they commenced very weak; the os tinæ, however began to dilate. Ergot of rye was given without any effect, (ʒiss. in ʒss doses). After twelve hours, when the os tinæ was dilated to the size of a crown, her pulse became weak, and she complained of being faint. She was immediately delivered by the crotchet of a very putrid child, about the fifth month. There was no difficulty in the delivery; nor was there, excepting faintness, any unfavourable symptom. From this she re-

covered by the usual remedies; every thing seemed to go on well until the fourth day, when she complained of tenderness in the left iliac region. Her pulse was 100, weak and unsteady; tongue dry in the centre, with symptoms of low irritative fever; under these symptoms she sunk on the third day from attack, symptoms of debility prevailing from the commencement.

Autopsy.—The intestines were all united by adhesions which were easily separated; a quantity of sero-purulent fluid filled the abdomen; the ovaries were soft and mottled with black spots; the peritoneum was raised from the left side of the uterus, forming a large black tumour filled with coagula; the posterior parietes being divided, on the internal surface the cavity was plainly seen, surrounded with a ragged margin, being the remains of the anterior portion of the cervix, which was softened and lacerated; the body of the uterus had lost its elasticity. So far as the peritoneum is concerned, its appearances were similar to those met with in puerperal fever, but at that time there had not been a case of that description for three years previously in the hospital, nor was there any appearance of the epidemic until August, 1834, a year and three months after; neither had she any of the characteristic symptoms of the disease; the tenderness of the abdomen was slight, and did not continue. Besides, I know of no instance in which the structure of the uterus was thus altered by the fever, on the contrary, it generally is free from any change, except purulent infiltration.* I conclude, therefore, that the diseased state of the uterus gave rise to the constitutional symptoms which appeared, and that the gradual effusion of blood under the peritoneum from the ruptured sinuses caused the debility and ultimately the death of the patient.

* I since met a case of puerperal fever in which the uterus was quite flaccid from serous infiltration of its structure.

CASE VI.—*Rupture with softening : Face Presentation.*

Catherine Carthy, aged 30, was admitted November 18th, 1833, in labour of her fifth child. The face was found presenting; notwithstanding, her labour went on favourably; after fifteen hours, she was delivered of a living child without assistance. The face was far less disfigured than is generally met with in these presentations; while being skirted, she complained a good deal of its tightness, as well as of pain when the fundus uteri was pressed; there was no other symptom to attract notice. In the evening, however, her pulse was 130, quick, and rather weak; both iliac regions were tender on pressure; the following day the abdomen became tympanitic; countenance rather anxious; pulse the same; the lochial discharge continued, and was not offensive. On the 22nd, the symptoms of peritonitis were well marked; the abdomen very tender, and quite tympanitic; pulse small and incompressible; very much distressed from flatus; she had occasional vomiting of frothy mucus. 23rd; the pulse became very weak; she could not turn off her back; countenance very anxious, and jaundiced. She died on the 24th.

Autopsy.—On opening the abdomen, a quantity of blood, mixed with serum, escaped. The omentum and intestines were united by pretty firm adhesion. The peritoneum covering the uterus was thickened; on the left side of which a quantity of clots surrounded a rent of about three inches; this exposed a cavity containing coagula formed in the fibrous structure of the uterus, which communicated with the lining membrane by three openings, the largest about the size of a sixpence, and apparently the effect of ulceration.

It would seem that in this case some of the fibres of the uterus had given way at the time of labour, that blood was gradually poured from the ruptured vessels, until it formed a large tumour, which soon opened on the membranes, (the lining membrane perhaps first,) by ulceration. The inflamed peritoneum

giving way by a direct rent, and thus emptying its contents into the abdomen.

CASE VII.—*Rupture, with softening, in a contracted Pelvis.*

Bridget Fitzmorris, ætat. 26, was admitted February 14th, in labour of her sixth child, a girl. In 1826 she was delivered by the crotchet, of her first child, in the hospital. The second, by the natural efforts; third, forced delivery; fourth and fifth, natural. Her labour was strong from the time of admission, (2 o'clock, P. M.,) the waters had drained off, and in nine hours the os tinæ was almost fully dilated; the head was found resting very much on the pubis; in half an hour after, (11½ o'clock, P. M.,) without any sudden exclamation or complaint, the pains went off; pulse became rapid and weak; countenance anxious; respiration laboured; and the stomach discharged a dark-coloured fluid. The head was immediately lessened, the uterus still acting in the expulsion of the body and lower limbs. She was then given a large opiate, and afterwards cal. gr. x. p. jalapæ xv.; an active mercurial treatment was pursued, (cal. gr. iv. opii. gr. ½ 2da q. q. hora;) mercurial frictions; leeches to the abdomen. On the 15th, symptoms of peritonitis were very distinct; pulse small and incompressible, 120; abdomen tympanitic. Leeches and stupes were repeated; contr. cal. c. opio. At the evening visit; pain of abdomen very acute, no remission in the symptoms; ʒxvj. of blood were taken from the arm, and the same treatment continued, with the addition of a warm-bath. She slept quietly for some hours, when the same symptoms returned with increased violence, and could not be controlled. She died the following morning.

Autopsy.—All the intestines highly injected, some adhesions, but very slight, some bloody serum was through them, and surrounded the uterus, the peritoneal surface of which was red and vascular. At its anterior part the peritoneum was raised from the uterus, and lay loosely between it and the bladder. At that part the neck had given way, and was softened in its structure, a cavity was formed in its substance, but emptied

of its contents, which passed into the abdomen through a rent in the peritoneum, two and a half inches in extent. The fundus uteri was soft and doughy, the fibrous structure easily peeling off. The liver was large and pale, the gall-bladder greatly distended with bile; the spleen was very soft; the ovaries were equally so, and mottled with dark spots; the antero-posterior diameter of the brim was three and a half inches.

This case is another instance of the changes which occur in the organization of the uterus, previous to laceration, even where the pelvis is contracted in its diameter; it also shows, from the children that had previously passed or were brought through such a pelvis, the degree of injury which the healthy uterus will bear, or rather the great power which it has of resisting injury when placed in unfavourable circumstances. In the cases which are just stated, the patients had several children before the accident happened. I have met one instance in which similar appearances to those mentioned were found to present themselves after rupture with a first child.

CASE VIII.—Judith M'Gauly, ætat. 30, was admitted May 30th, 1833, being sent in from the country, in a very neglected state. It was her first child; the length of time she had been in labour could not be ascertained. The waters were discharged; os tinæ dilated somewhat more than a crown-piece; the passages extremely hot and tender, and the bladder enormously distended with urine. The urine was immediately drawn off, and a turpentine enema administered. Her pains, which had been suspended, were renewed, causing her more than usual distress. The head, which was in the brim, made no advance with the pains, but remained fixed; her countenance was anxious; pulse 120. She could not remain quiet in any position, throwing herself about the bed, and asking for relief. She was delivered by the crotchet; a most offensive discharge, mixed with blood, flowed from the uterus; she soon vomited a dark-coloured fluid; pulse became weak, and countenance collapsed. A large opiate was given, which was repeated in two

hours. She dozed a little at intervals for a short time, but afterwards remained watchful; the abdomen swelled up very fast, and became very tender; the pulse continuing weak and unsteady, sometimes not easily felt. She died the following morning, about twenty-four hours after her delivery.

Autopsy.—The peritoneum was extensively inflamed in the first stage; the intestines highly injected, but scarcely any adhesion. The uterus was much inclined to the right side. On the opposite surface there was a broad patch, of a dusky green colour, quite soft; a little below this the peritoneum was raised up from the uterus into a black pyriform tumour containing coagula. On examining the internal surface, there was near the rent a similar green-coloured patch, but which extended up further than on the external surface. The uterus had given way at the anterior part of the cervix, very close to the vagina; and from this, as far as the dark green surface extended, the substance of the uterus was softened.

This case I at first considered to be gangrene of the uterus; nor was it until I met with those cases I have already related, in which I found appearances very nearly similar, that I was led to class them as the same. A name is, however, of little importance; the case sufficiently shows the effect of inflammation in preparing the uterus for rupture. Cases of this description are more frequent, I suspect, than is generally supposed. A woman dies some days after her delivery, apparently of peritoneal inflammation; no examination is made, or *sought for*, and the matter rests in obscurity, when perhaps all may have arisen from a neglected inflammation previous to her delivery. Such were the impressions the result of a case I afterwards met with produced.

CASE IX.—I was sent for (Jan. 4, 1834, 1 o'clock, A. M.) to see a poor woman (ætat. 46) in town, who had been attended by a midwife. She was in labour of her first child; what time she had been in labour I could not learn with accuracy, but I found her talking incoherently, rolling on the bed, and endeavouring

to walk about. Tongue was loaded; pulse 120, full and bounding; the os uteri dilated to the size of a sixpence, very rigid; the waters were reported as having been discharged twelve hours before. Her pains were (if I might use the expression) confused; they were of short continuance, but causing great distress; and in the intervals she still seemed to suffer, making it appear as if there was no remission. She was bled to ℥xx. , and given tart. antim. gr. $\frac{1}{2}$ every hour in solution, until nausea or vomiting was produced. 10 o'Clock, A. M., the same symptoms continued, the os tinæ not more dilated. A turpentine enema was then given; she was visited several times during that day, and though the incoherency had left her, and the pulse was less frequent, and softer, the os uteri did not yield in the least. The bleeding was repeated to ℥xvi. A bolus of cal. and jalap. was given, to be followed in three hours by an emollient enema (the first enema was not retained). The pains became weak during the night, but the following morning the os tinæ commenced its dilatation.

5th. The bowels not being moved, the enema was repeated, which procured several evacuations; her pains became more regular and efficient. After eight hours the os tinæ was open to the circumference of a breakfast-cup, the bones of the head felt loose, and the scalp œdematous. This confirmed the results of the stethoscope. The foetal heart was inaudible from the commencement, but the extreme difficulty of keeping the patient quiet rendered our examination uncertain. Pulse continued 120, but softer; tongue still loaded. She was delivered by the crotchet with great difficulty, the bones separating with the instrument. It was necessary to introduce the blunt-hook to assist the delivery of the superior extremity, and a very large and putrid child was extracted; the funis was quite putrid, and gave way at once. The placenta not coming away at the usual time, and no hemorrhage appearing, it was left for three hours, when it was expelled by steady and firm pressure on the fundus uteri. She was then given a bolus of cal. gr. vij. pulv.

jalapæ gr. xv. to be followed in four hours by haust. infus. sennæ.

6th. Her bowels were moved freely during the night; pulse 120; tongue dry and furred; abdomen tender and tympanitic, but bears pressure; slight sordes about the teeth. The midwife having left her, little information could be obtained as to the state of the vagina. A chamomile infusion, which was directed to be frequently injected, we found had been all given as an enema. She became rapidly worse; symptoms of peritonitis more distinct; abdomen quite tympanitic and tender; pulse 120, very weak; tongue dry. These symptoms increased, and she died on the fourth day from her delivery. We could not obtain a post mortem examination.*

Comparing this with the preceding case, I was led to attribute death to the same cause, softening and rupture consequent on inflammation; however, I was given no opportunity of verifying or correcting my opinion. I can only offer it as one of, I fear too many instances, in which ignorance or neglect, perhaps both, combine to produce a succession of symptoms which may terminate in such a result. The first symptoms of inflammation are passed over; the state of the tongue and pulse are unheeded, (to an ignorant person they can give no information;) the tenderness of the abdomen is considered as arising from the pains, which being in a degree suspended by the presence of such symptoms, they presently are found to be weak and of short duration. Stimulants are given to increase them, and frequent examinations made as to the state of the os uteri. Thus matters proceed, until the presence of some unexpected symptom, perhaps delirium, or the unusual appearance of the patient, excites alarm, and assistance is sent for precisely at the time when it can be least available.

* I omitted to state in the last case, that during delivery an extremely offensive discharge flowed from the uterus, and that the placenta was broken with the least force, both of which took place in Case 5, the former in Case 8.

The symptoms denoting such inflammation are indeed premonitory, and it is the duty of the attendant to watch and to counteract them. If for this purpose general means are insufficient, he should seize the first favourable moment, which the circumstances of the case will admit, to deliver his patient. Here it would truly be (to use Mr. Burns' words) "criminal to delay;" but it is also obvious that rupture in such cases is only one of many fatal effects which neglect will produce, and to avoid which a decided practice is required; neither from the urgency of such cases can we argue the necessity of interfering by anticipation in general; what becomes promptitude in the one case, will often prove but precipitancy in the other.

Whatever difficulty there may be, in general, in ascertaining previous symptoms, those which mark the occurrence of rupture are sufficiently clear; the sudden change produced in the system is so manifest, that they can hardly be mistaken by the most careless observer. The peculiar ghastly expression of the countenance, the sudden sinking of the pulse, the cessation of the pains, the tender and tympanitic state of the abdomen, retching, and hurried respiration: all afford strong evidence of what has taken place. This rule, however, is not without its exceptions; cases are occasionally met with where the symptoms are very obscure, and are calculated to deceive. In Cases 4, 5, and 6, many of the leading and more striking symptoms were absent. A hurried pulse, an unusual degree of faintness, tenderness over the uterus, the absence of pains, is all that may excite suspicion; the patient may appear quite tranquil, and yet the same mischief take place as, in another case, would produce the most alarming symptoms. In two of the cases (5 and 6) I have mentioned the uterus was softened; in the 4th, the cervix was thinned. Perhaps we might assume that in these cases the uterus gave way gradually, and therefore with less shock to the constitution, rather than was torn abruptly, as is generally the case. Still the expression of the countenance, in all the cases of rupture I have seen, is very remark-

able, and I think cannot easily be mistaken. Another source whence obscurity arises is where inflammation is present; when rupture takes place under such circumstances, its symptoms are mixed up with and disguised by those of inflammation; but it is scarcely necessary to add, that the existence of such symptoms requires as prompt an attention, and as decided practice, as rupture itself. After a labour in which the pains become insufficient in advancing it, if inflammation happens, it is often ushered in by rigors of increased severity; the passages are hot, dry, and exquisitely tender. Without any direct pressure on the urethra the urine is retained, and the introduction of the catheter painful. The pulse becomes frequent, (120,) quick, and sometimes bounding; tongue loaded; uterus tender; thirst is increased; the stomach generally rejecting what she drinks; presently the abdomen becomes tympanitic. During her pains her agony is extreme; she complains of a sensation as if she was bursting; in the interval she gets little relief, she is still suffering pain, though in a less degree; the pains again return with the same symptoms; they become short, and are accompanied with a distressing whine, rather than the full deep tone of the true bearing pain. She becomes restless, cannot remain quiet in any position; the countenance expresses all her suffering; the cheeks are irregularly suffused, and marked with a patchy redness; the eyes starting wildly with the pains, or dull, and gazing listlessly in the intervals. If these symptoms are suffered to proceed, they are succeeded by others still more alarming. The abdomen is quite tympanitic; the pains come on at longer intervals (sometimes there appears to be no interval); a dark and highly offensive discharge flows from the vagina. Vomiting becomes dark and grumous, like coffee grounds. Very foetid discharges from the bowels, and a low muttering delirium; all combine to point out a case of the worst description, and which, if it be suffered to proceed thus far, the addition of a ruptured uterus is almost immaterial.

The symptoms which follow rupture of the uterus may be divided into three stages: 1st, Those denoting constitutional shock: viz., fluttering pulse, anxiety, hurried respiration, restlessness, &c. 2nd, An interval usually of short duration, in which the pulse becomes unsteady, though frequent, weak, and compressible; the countenance resumes its natural appearance, the surface warm, and the tenderness of the abdomen slight: in this interval the symptoms fluctuate between debility and commencing inflammation. Soon, however, the third stage appears, in which the symptoms of peritonitis are distinctly marked.

As in these observations my object is rather to point out those facts which are but slightly touched upon, than enter into a detail of the entire subject, I shall state, in a very few words, the treatment pursued, which I believe to be that generally adopted. In the first stage a large opiate was given, with some stimulant, which if the stomach rejected, it was repeated in the common effervescing draught; when rest was procured, and this stage passed off, it was an object to procure an evacuation from the bowels. A bolus (cal. gr. x. p. jalapæ gr. xv.) was administered, to be followed by an emollient enema, or a draught of castor oil. In all the cases, with one exception, (Case 4,) I have met with, the bowels were remarkably obstinate. Some serous stools were procured, but no feculent evacuation until the gums were salivated; the symptoms of peritonitis, as they appeared, were treated by local depletions, an active mercurial course, (cal. gr. ij. to iv. opii. gr. $\frac{1}{2}$, 2^{da}. q. q. horâ,) warm baths, fomentations, &c.; when salivation took place there was generally a remission of the symptoms. The abdomen became soft, stools natural, and pulse fuller; but diarrhoea soon supervened, accompanied with bilious vomiting. When this threatened, mercury was immediately omitted, and opium with astringents substituted; if checked, which it was for a short time in some of these cases, there was an evident improvement in all the symptoms; but it always returned, and the patient sunk under its effects. It is remarkable, that in

cases which have recovered, the bowels were easily affected, and very mild purgatives were found sufficient for the purpose, (vide two Cases published by Dr. Collins, late Master of the Lying-in Hospital, Dub. Med. Trans. vol. i.) while in general, and in fatal cases, the contrary took place. The advantage then of having the bowels emptied, if possible, before inflammation sets in, and adhesions can take place, is obvious. This, unfortunately, is seldom to be attained, and at a later period, the risk of bringing on diarrhoea renders purgatives hazardous; recent adhesions may be again torn up, and hæmorrhage succeed, an event which, in so critical a case, would turn the balance entirely against success. A favourable moment lost is not to be regained in such cases, and the value of Dr. Collins' remark must appear evident, "that early and active means of counteracting the dangerous and sudden inflammation that sets in, in all cases of this kind, is a matter of the utmost importance."

The result of these observations, derived from the cases I have detailed, lead me to the following conclusions.

1st. That a perfectly healthy uterus is very rarely ruptured, excepting from external injury.

2nd. That in most of the instances where it occurs, it may be traced to morbid lesions, either previously existing, or produced by inflammation; and even in some cases, where this cannot satisfactorily be proved from inspection, the history of the case would seem to indicate it.

3rd. That rupture may occur in cases where the labour is not unusually prolonged, nor the pains violent; on the contrary, it has happened where the pains were weak, and the progress of labour in every other respect favourable.

4th. Comparing cases in which rupture has taken place with cases of tedious and difficult labour generally, it appears to me not so much to be apprehended in the latter class of labours, as is generally supposed. It seldom occurs with first children, that peculiarly belong to that class, while in those cases,

where there have been previously difficult labours, even requiring iustrumental aid, and where the uterus was of course exposed to all the disadvantages to which rupture is generally attributed, the uterus did not give way until in a subsequent labour, where it has yielded to very trifling uterine action.

5th. That inasmuch as premonitory symptoms are often absent where rupture occurs, and present in those cases where delivery has been safely completed by the natural efforts, they are too uncertain to take as guides for practice, more especially as we may be led by them into a mischievous interference. As a rule, they should always be coupled with the previous history of the case; whether the woman has had many children? previous difficult labours, or whether instruments were necessary? the state of the uterus previous to conception? &c. &c. These queries, which are founded upon the assumption of organic lesions, I would consider necessary to guide and justify me in an interference which otherwise might be premature.

In the remarks which I have submitted to the profession, I seek not the merit of novelty; I am fully aware that in the present day, novelty, like the philosophers' stone, is a treasure always sought after, often asserted, but never attained. If what I have said throws any light upon obscure cases, or may lead to a closer pathological investigation, which may correct or confirm my views, my object is sufficiently attained.

I cannot conclude this paper without alluding to a very interesting case, published by Mr. White in the 15th Number of this Journal. A lady pregnant of her ninth child met with a fright, causing her to turn round quickly; she was immediately seized with pains, faintness, and palpitation, which then passed away; eight days afterwards they returned in an increased degree, labour supervened, and after a few pains, she was delivered of a full grown still-born male child; in three quarters of an hour she expired. After death it was found that considerable hæmorrhage had taken place into the abdomen, and on the anterior surface of the uterus were two long tears or lacera-

tions, and one of smaller size through the peritoneal coat, and through a few superficial fibres of the uterus. This seems to be one of those very rare cases, in which laceration, whether partial or complete, takes place before labour has commenced. In Dr. Spark's case, which I have quoted, a fall on the hands and knees caused an extensive laceration. In Mr. Else's, an excursion to Greenwich is the only cause assigned for rupture, at the time of quickening; but what is more to the point, Dr. Ramsbotham's case of sudden death, in the last month of pregnancy, occurred in the excitement of social amusements; after death blood was found extensively effused under the peritoneum, which however had not given way. Mr. White's case appears to be analogous to these. I would suppose that, in the first instance, when she was seized with pains, faintness, and palpitation, the fibrous structure, perhaps diseased, had partially given way, and in place of producing instant death, as in Dr. Ramsbotham's case, the effused blood formed a species of diffused aneurism under the peritoneum, which subsequently giving way, poured the whole contents of the sac into the abdomen, thus causing fatal hæmorrhage. I would presume the fibrous structure to have been diseased, for in all the cases I have met with, where softening was found, the peritoneum was detached, and either raised up by coagula underneath, or it gave way, and poured the blood and clots into the abdomen. In the cases I have quoted, also, the uterus appeared to have been diseased. From these cases, however, Mr. W.'s differs in the laceration being partial, and confined to the external surface, and in this respect agrees in some degree with those to which he has alluded. Whether a few fibres be torn, or the whole be ruptured, seems to me after all but an accidental difference, the effect of opening the sinuses is the same. Where such trifling causes produce such extensive injury, it is an additional reason for examining accurately into the structure of the uterus, whether any or what alterations may have taken place in it, and in this point of view I have assumed disease of the fibrous structure in Mr. W.'s case. However he has not so stated it, and we

must look upon it as an interesting addition to that class of (fortunately very rare) cases in which rupture of the uterus and sudden death take place, without any satisfactory cause to account for or explain it.

ART. XII.—*Researches on the Symptoms and Diagnosis of Aneurisms of the Thoracic Aorta*. By GEORGE GREENE, M. D., Fellow of the College of Physicians; one of the Medical Inspectors of the House of Industry, and Lecturer on the Practice of Medicine in the Richmond Hospital School of Medicine and Surgery, &c.

THE difficulty of ascertaining the existence of an aneurism of the thoracic aorta in its early stage, and before it has given unequivocal external signs of its presence, is, I believe, very generally acknowledged by those practitioners who have directed their attention to the investigation of this subject. Laennec, it is well known, expressed it as his opinion, “that in the present state of our knowledge, there assuredly exists no certain means of ascertaining the existence of this disease, until it shows itself externally, and that even when the tumour has made its way through the parietes of the chest, it is not always distinguishable from tumours of a different kind.”* It is now, however, with great reason supposed, that the inventor of the stethoscope undervalued its powers in detecting the disease in question, and in particular Bertin† and Dr. Hope‡ state, that with its assistance the diagnosis of aneurisms of the aorta does not present more difficulties than the diseases of the heart and lungs.

In order to show that these authors have not spoken of the power of this instrument in too favourable terms, I shall proceed to detail some cases of aneurism of the thoracic aorta, in

* Forbes's Translation, p. 690.

† *Maladies du Cœur*, p. 143.

‡ Art. Aneurism of Aorta, *Cyclopedia of Medicine*.

which a correct diagnosis was given, in the absence of any external symptom, and where the principal signs were obtained by careful and repeated examinations with the stethoscope. I shall in the first instance relate the cases with as much conciseness as possible, and afterwards offer some remarks, which a consideration of them has suggested to me. For the dissections of these aneurismal tumours, and for very copious and accurate notes of their histories, I am indebted to Mr. Robert Mayne, the Clinical Clerk of the Whitworth Chronic and Hardwicke Fever Hospitals, House of Industry.

CASE I.—*Double Aneurism of the Thoracic Aorta. Sudden Death from Rupture of the Sac into the left Bronchial Tube.*

Luke Moran, a sawyer, was admitted into the Whitworth Hospital, House of Industry, on the 7th of April, 1834. He had been subject for the last two years to a cough, attended with great dyspnœa, and frothy expectoration. The cough seized him in paroxysms, generally at night. He also complained of irregular pains, of a lancinating character, through the chest. These symptoms became so severe and unremitting, that he was obliged to discontinue his business six months previous to his admission.

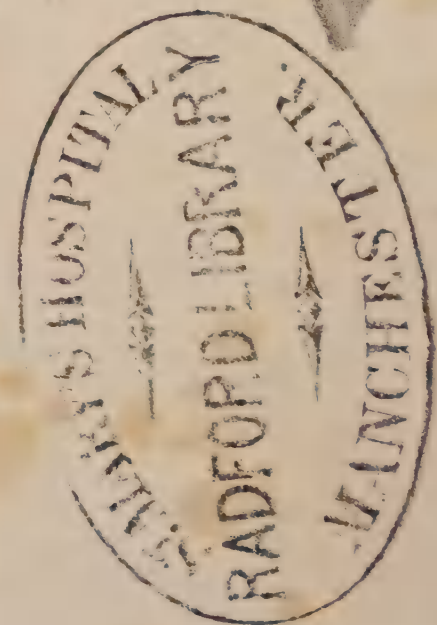
When he came under my care the following were his symptoms. A cough of the description mentioned above, and which lasted for half an hour at a time. He described it as attended with a sense of impending suffocation. The dyspnœa was induced or aggravated by the slightest exercise; he referred to the top of the sternum as the seat of the greatest distress. During the act of inspiration, the trachea was deeply drawn behind that bone; his breathing was laryngeal; he complained of darting pains through the chest, and slight dysphagia; the pulse in the radial arteries was the same; turgescence of left jugular vein; there was no external tumour or visible pulsation; nor œdema or numbness of the upper extremities. The chest

Aneurisms of the Thoracic Aorta.

Fig. 1.



Fig. 2.



sounded clear all over, on percussion ; on applying the stethoscope, a distinct impulse was communicated to the instrument over the upper third, and to a short distance on either side of the sternum. The impulse was much stronger than that of the heart ; it was not attended with any distinct bruit ; respiration in left lung feeble, loud and clear in the right, especially on a forcible inspiration. There was also a distinct impulse communicated to the instrument for a considerable distance down the back, to the left of the spinous process of the vertebræ ; no purring tremour could be detected ; a distant but distinct bruit de soufflet in this situation ; impulse and sounds of the heart normal. When the instrument was applied to the axilla, or to the back, in the situation mentioned, the respiration appeared to be almost laryngeal in the top of the left lung, but was natural in the right, and loud and distinct. On the supposition of there being an aneurism of the aorta, he was ordered the *mistura digitalis* of the hospital, and a small bleeding from the arm, with leeches to the top of the sternum. He remained under this treatment for five days ; on the morning of the 12th April, just as I had left his bed, and had proceeded to the case next in the ward, I heard him give a sudden cry, and on turning round, observed him sitting up with his hand pressed on the left side, and ejecting blood from his mouth. His countenance was indicative of great alarm ; on questioning him he complained of intense pain in the mammary region of the left side, and expressed his conviction that he was about to die. The quantity of blood spit up was considerable, and was of an arterial colour. A loud rattle, resembling a mucous rale, was audible in the top and centre of the left lung. From the moment he uttered the cry, he rapidly sunk. His pulse became weak, and in a short time imperceptible ; the respiration more and more laboured ; his forehead was covered with a cold perspiration, and in half an hour from the first accession of the pain, he died with the lips and extremities cold and ex-sanguineous.

Post mortem examination.—The heart and pericardium did not present any unnatural appearance. On cutting into the

substance of the left lung, its parenchymatous structure was found to be injected with blood, which was also found in great quantity in the pleural cavity. The right lung was similarly injected in its posterior half, its anterior edge was emphysematous. The injected portions could easily be broken down by the finger. The aorta was enlarged, and on slitting it up atheromatous deposits were found between its inner and middle coat. From the anterior surface of the vessel, at the point where it winds round the left bronchial tube, an aneurismal sac was discovered about the size of a small orange; it communicated with the left bronchial tube by an opening just large enough to admit a probe. The interior was lined with fibrinous deposits, and it had slightly compressed the left bronchial tube. The œsophagus was situated to the right of the tumour. On removing the lungs, another aneurism on the anterior surface of the aorta was discovered, somewhat larger than the first, and corresponding to about the seventh dorsal vertebra. It had contracted strong adhesions to the posterior surface of the left lung, and the interior was also lined with fibrous deposits similar to the first.

CASE II.—*Aneurism of the descending Portion of the Arch of the Aorta.—Sudden Death without Rupture of the Sac.*

The case I shall next detail was that of a woman named Anne Lee, aged 27. She was of a full habit, and a florid complexion, and was admitted into the Whitworth Hospital on the 8th January, 1835. The history she gave of her case was as follows:—About two months previous to her admission she fell down a flight of stairs on her back, since which time she experienced pain and continual weakness in that situation.

The pain, on her admission, was confined to the part of the spine corresponding to the second, third, and fourth dorsal vertebræ. About six weeks before she applied for advice, a cough, attended with a sense of tightness and oppression of the chest, made its appearance, followed shortly afterwards by a difficulty in swallowing. The increasing severity of these symptoms induced her to apply for admission into the hospital.

My attention was first forcibly directed to this case by

hearing the woman cough. It was loud, harsh, and of a peculiar ringing character, and the same retraction of the trachea, deep behind the sternum, was observed in this as in the former case. Before I proceeded to explore the chest I took the following note of the general symptoms. A loud, harsh, and ringing cough, attended with a frothy and rather copious expectoration. It seizes her in paroxysms, during which she is obliged to sit up in bed for fear, as she states, of suffocation. The cough is nearly incessant, but particularly severe at night; dyspnoea distressing, especially on making the slightest exertion. A difficulty in swallowing, referred to the upper third of the sternum, where the morsel appears to stop, and she requires the aid of a drink to assist it on to the stomach. She complains of a pain on pressing the third and fourth spinous process of the dorsal vertebra. The pain is of a darting character, shooting from the spine across to the sternum, and completely traversing the thorax. Pulse in both wrists the same in strength and regularity; no numbness, or twitchings, or œdema in the upper extremities. Appetite good; tongue clean and moist; bowels regular; respiration hurried; catamenia deficient the last six months; pulse 98, full and regular.

The following were the signs furnished by the stethoscope: A clear sound obtained all over the chest on percussion; the respiration in the right lung distinct, but accompanied by a kind of blowing sound, when the instrument was applied posteriorly, about the situation of the bronchial tube, or in the axilla of the right side. The respiration in the left lung was feeble, and sometimes nearly inaudible. An obscure impulse, accompanied by a bruit de soufflet, in the interscapular region. Both these phenomena most distinct at the left side of the spine, and confined to the situation where she complained of pain on pressure: they were most remarkable when the arterial system was excited by any sudden exertion. Anteriorly an impulse was communicated to the stethoscope at the sternoclavicular articulation, and sub-clavian region of left side. The impulse was attended with a double sound, and was some-

what stronger than that of the heart. An obscure bruit de soufflet was heard in the same situation; the impulse and sounds of the heart were natural. She complained of pain when percussing the top of the sternum. She was ordered a small bleeding from the arm, leeches to the top of the sternum, and a mixture containing tinct. digitalis. She was allowed a little meat for dinner, with milk for breakfast. Absolute rest enjoined. Under this treatment she appeared to have obtained relief for a short time, but the cough, dyspnœa, shooting pains, and difficulty of swallowing soon returned with increased violence. General and local bleeding on several occasions were necessary to mitigate the severity of these symptoms.

On the last examination, two days before her death, I took the following note of her symptoms:—February 3d, a strong double impulse a little below the sterno-clavicular articulation, at the left side of the median line of the sternum, accompanied by two distinct sounds, and a clear bruit de soufflet. Impulse diminishes towards the heart, which retains its natural impulse and sounds. No expansive pulsation found on pressing the fingers deep behind the clavicles; left jugular vein turgid. Posteriorly, at the situation of the third and fourth dorsal vertebræ, a decided and, apparently, a single impulse, accompanied with a bruit de râpe, communicated to the instrument. These signs diminish in intensity as the stethoscope is applied down the spine at the left side. Respiration presents the same characters as on the first examination, but more clearly marked. On pressing the ball of the thumb forcibly to the spine, at the situation of the impulse, a tremor is communicated to the hand; the pressure produces pain. On looking along the anterior surface of the chest horizontally, a distinct elevation perceptible at the top of the sternum, where percussion, also produces pain, and a pulsation can be felt; no dulness in the situation of the impulse. All the general symptoms increased in severity. The dyspnœa causes her great alarm, and makes her frequently start u in bed and call for assistance.

She died suddenly on the night of the 5th February, as I understand from the nurse, in a fit of dyspnœa, before assistance could be procured.

Post mortem examination.—On opening the chest the heart and pericardium were found to be natural. An aneurismal tumour was discovered arising from the descending portion of the arch of the aorta, where it is in contact with the left bronchial tube, and stretching across the vertebræ to the right side. The œsophagus ran directly in front of the tumour, separating it from the bifurcation of the trachea. At the junction of the transverse with the descending portion of the aorta, a smaller aneurism, large enough to contain a bean, extended behind, and pressed upon the left bronchial tube, between it and the œsophagus, and communicated with the aorta by a well defined opening. The larger tumour rested upon the bodies of the third and fourth dorsal vertebræ; the osseous portion of which was absorbed, leaving the intervertebral substance prominent. This portion of the spine formed the posterior wall of the sac, the pressure of which had somewhat flattened the right bronchial tube. The sac communicated with the aorta by a well defined opening, large enough to admit a man's thumb. Its interior was lined with a firm fleshy-looking coagulum, and did not appear to contain much recently coagulated blood. Its size was about that of a small orange, and the walls were perfect.

CASE III.—*Aneurism of the Thoracic Aorta.—Sudden Death from Rupture of the Sac into the left Bronchial Tube.*

This case was first diagnosed by Dr. Wm. Stokes, at the Meath Hospital. The accuracy of his examination will be best perceived by reading the following note, which was taken when the aneurism must have been in a very incipient state, and is on that account very valuable. The case is also interesting, because the same physical signs were discovered at the Richmond Hospital, House of Industry, where, previous to the man's death, he was examined by myself and Mr. M'Dowell,

whose patient he became, and both of us were satisfied as to the existence of the disease. I shall first, by Dr. Stokes's permission, insert his note of the symptoms, and afterwards that of Mr. M'Dowell, which was copied for me by Mr. Mayne, who, with Mr. Cumming, one of the pupils of the Richmond Hospital, diligently observed the progress of the case. The following is Dr. Stokes' account of the examination of the case, with the diagnosis he made at the time.

Suspected Aneurism of the Arch of the Aorta.

Michael Hughes, a butler, ætat. 38, a stout, well made man, was admitted into the Meath Hospital, complaining of great dyspnœa, cough, and wandering pains about the back and chest. The whole of the chest sounds clear on percussion. Respiration in the right lung intensely puerile, altogether absent in the superior portion of the left, and only feebly audible in the inferior portion. On applying the stethoscope to the left axillary region, and the patient being desired to draw in a deep breath, no sound is heard during the first half of inspiration, but during the latter half the air appears to overcome some obstruction to its entrance, and suddenly rushes in to expand the lungs. The left side of the chest is almost immovable during respiration, but the right acts freely. On applying the hand to the upper part of the left side, no vibration of the voice could be detected. The vibration is very feeble below on the same side, but well marked on the right side; impulse and sounds of the heart natural; a strong double pulsation is heard over the sub-clavicular region of the left side, also over the postero-superior portion of the same side, and on applying the hand over the former situation a distinct impulse is communicated to it; no bruit de soufflet could be detected. The cough is loud and ringing, and of a peculiar croupy character; expectoration scanty, consisting of frothy mucus; respiration hurried. Pulse 86, and moderately full; tongue clean, appetite good; never had any difficulty in swallowing, or pain in the throat. He attributes his complaint to cold caught five months ago from sleeping in a damp pantry,

shortly after which he became affected with perspirations, wandering pains in the back and sides, increased upon exertion, and attended with some dyspnoea. The pain in the back he describes as being of a lancinating character, resembling that which would be inflicted by a knife. The distress of breathing increased, with inability to use any violent exertion, and after some time was attended by a loud dry cough. The treatment since he entered hospital has consisted chiefly in local depletion, together with small doses of tinct. digitalis.

May 2nd. A strong double pulsation is now heard across to the right clavicle; the pulsation has increased in the sub-clavicular region, and also over the scapula, with a strong impulse below the middle third of the clavicle; after the patient walking several times up and down the ward, a sharp well-marked bruit de scie was detected in the latter situation. It disappears, however, after the patient has remained quiet for a short time, and again returns after exercise.

I shall now insert the report of the physical signs taken from the case-book of Mr. McDowell, at the Richmond Hospital.

Anteriorly the right side of the thorax sounds well on percussion; a little dulness in the sub-clavicular and mammary region of the left side; respiration in the right lung remarkably loud and clear, very obscure in the left lung, except on taking a deep inspiration, which produces a feeble vesicular murmur. A strong impulse communicated to the stethoscope, two inches below the clavicle, and about an inch and a half to the left of the median line of the sternum; impulse also perceptible across the sternum to the right clavicle; it is greater than that of the heart, and appears to be double; it is also perceptible to the hand. A slight impulse communicated to the stethoscope at the left side of the second and third dorsal vertebræ; no bruit de soufflet could be detected in this situation, nor anteriorly except after great exertion; pain on percussion of the upper third of the sternum, and in the situation of the vertebræ above mentioned. His general symptoms are severe cough of a shrill

croupy character, attended with copious frothy and purulent expectoration. Excruciating pains of a lancinating character, extending from the superior part of the chest, in various directions; urgent dyspnoea, and copious perspirations, confined to the head and chest; does not complain of difficulty of swallowing; the jugular vein of left side distended; pulse in both wrists the same; does not complain of numbness in his arms, nor is there any œdema of the upper extremities; impulse and sounds of the heart natural. These symptoms increased progressively, for which he was occasionally bled, and put under the influence of digitalis, with counter-irritants. Nothing, however, appeared to give him decided relief, and he expired suddenly one night during a fit of coughing; at the same time spitting up a quantity of blood.

On dissection an aneurismal tumour was found arising from the descending portion of the aorta, and pressing upon the left bronchial tube, which was considerably indented and narrowed. The posterior wall of the sac was made up by the bodies of the second and third dorsal vertebræ, the osseous portion of which was absorbed, and presented nearly the same appearances as in the case last detailed. The interior of the sac was lined with a fibrous coagulum, and it opened into the left bronchial tube; the œsophagus was slightly pushed to the left side; the interior of the aorta was crowded with antheromatous depositions between the internal and middle coat; the heart and pericardium were natural.

On examining these cases, it will be perceived that there were some symptoms common to them all. The first I shall consider is the remarkable difference in the respiration of the two lungs, and I am the more anxious to call attention to this fact, from its having been much insisted on as an additional means of assisting our diagnosis in this disease, in a valuable paper on the pathology and diagnosis of aneurism, by Dr. William Stokes, in the fifth volume of the *Dublin Medical Journal*.

The value of the sign, according to Dr. Stokes, consists in

this, that the absence of respiration cannot be accounted for by any lesion of the lung, discoverable by auscultation or percussion. The fact of there being a clear sound on percussion, and at the same time a feebleness of the respiration, naturally leading to the conclusion that some impediment must exist to the entrance of the air into the lung on inspiration. He also suggests that perhaps it may be found, from further observations, that a solid tumour pressing on the bronchial tube will produce a permanent feebleness of respiration, but that an aneurismal tumour may allow of the occasional reappearance of it, according to the variable nature of the contents of the sac. I could not perceive, however, in any of the cases above mentioned, that this latter phenomenon took place, but I found the fact of a feeble respiratory murmur, combined with a forcible entrance of the air into the bronchial tube on deep inspiration, of great assistance in forming a diagnosis. The only case I have met with of a solid tumour compressing the trachea, or its divisions, was that of a woman named Mary White, who was admitted into one of the chronic wards of the Whitworth Hospital, for acute bronchitis. The general symptoms of this affection were strongly marked; and the clearest evidence of it obtained by percussion and auscultation. She was treated by bleeding, which it was necessary to resort to several times, and put under the influence of tartar emetic. This treatment gave her decided relief; but the symptoms uniformly returned with the same violence upon discontinuance of the treatment. This led me to examine the chest with great attention; I suspected an aneurismal tumour might be the cause of the great dyspnœa, and recurring cough, but after several examinations, I could not satisfy myself as to the existence of this affection; no appreciable difference in the respiration of the two lungs could be discovered, nor was there an anormal pulsation in any part of the chest. The bronchial râles were intensely loud; the dyspnœa, notwithstanding every attempt to relieve her, increased in frequency and severity, and

she expired one night in the act of rising from bed, apparently with a design of seeking relief from an upright posture.

On dissection I found an enlarged bronchial gland about the size of a large walnut, just in the bifurcation of the trachea, and adhering to it. It was filled with osseous and caseous deposits, similar to those mentioned by Mr. Carswell and other pathologists; scrofulous matter was found in the right bronchial tube, but there was reason to suppose it had escaped from the tumour, by an incision accidentally made in examining the parts. The dyspnœa in this case could not have arisen from the pressure of the tumour on the bronchial tubes, as their natural calibre was not in any way altered. It is more reasonable to ascribe it to the irritation of the nerves, particularly of the phrenic, which was in close contact with the sharp spiculæ of bone, with which the tumour was studded. These nerves are accurately shown in the preparation of the tumour, and were carefully dissected by Mr. Robert Smith, Curator of the Museum of the Richmond Hospital. It would have been interesting to have observed in this case whether the dyspnœa would have increased, as it almost invariably does in the case of aneurism, on making the patient walk quickly, so as to increase the circulation, and thus produce a distention of the sac, but being persuaded of the non-existence of that disease, I did not resort to this expedient. The bronchial tubes presented through their entire extent marks of intense inflammation.

In the two last cases of aneurism, the effects of the pressure of the tumours on the left bronchial tube are shown in the plates accompanying this paper, and in the case of Hughes in particular it will be seen, by an inspection of the drawing, how, in the act of inspiration, the air rushed through the tube in the manner described by Dr. Stokes. When I examined this man, I did not detect the phenomenon of the inspired air appearing to overcome an obstacle, but considerable changes must have occurred in the sac since the time the disease was first discovered. Notwithstanding this circumstance, I have no doubt,

that had my attention been directed to the sign in question, I might have detected it, but as it was, great feebleness of respiration was what I observed.

In the case of Lee, the compression of the tube was not so obvious, as it was produced by the smaller tumour, which requires a manual examination of the preparation, to be seen properly, and could not be well delineated in the drawing. This smaller tumour pressed the œsophagus against the left bronchial tube, and hence produced the great dysphagia. From its position, also, it must have nearly prevented the ingress of air into the left lung. In the first case the left bronchial tube was also compressed, and the respiration of that lung consequently feeble; but as I did not suspect the existence of the second aneurism, I neglected to examine the postero-inferior portion of the lung, with the same accuracy I would otherwise have done, and consequently cannot state what modification of the respiration took place in consequence of its pressure on the lung.

In alluding to this sign, it is not meant to be inferred by Dr. Stokes, that it will be found to be pathognomonic of the disease in question, as it may be produced by other tumours besides those of aneurism; but it becomes important when occurring with the other symptoms of the affection, both general and physical. It is clear also, that an aneurism may be developed in the inferior descending portion of the aorta, where we would be altogether deprived of this sign. From studying the anatomy of this vessel, so accurately described by Professor Harrison,* it will be seen, that a long portion of it, from about the third dorsal vertebra to its entrance into the abdominal cavity, is unconnected with the primary divisions of the trachea, and hence, whatever modifications in the function of respiration may be produced from pressure of the tube must be sought for in the portion of the lung inferior to these divisions.

The next sign I shall consider as having occurred in these

* Harrison on the Surgical Anatomy of the Arteries, third edition.

cases, is the fact of an anormal pulsation in the interior of the chest. It will be recollected that Laennec did not place much reliance on this symptom, except when it occurred under the form of a strong single impulse. Several circumstances, however, may prevent us from perceiving this single impulse, when the chest is examined anteriorly. The proximity of the tumour, for instance, to the heart, as at the origin of the aorta, will necessarily render the occurrence of this phenomenon less available for diagnosis, from the contiguity of the impulse of that organ. Again, should the tumour be situated at the descending portion of the aorta, its impulse will be masked by that of the heart which lies before it. These difficulties will be increased in hypertrophy of the organ; notwithstanding these obscurities, however, the sign alluded to is a most important one. It has been remarked by Dr. Hope, that when this phenomenon occurs posteriorly, particularly when accompanied with a sound of a rasping character, it is almost a positive indication of the development of aneurism, and I found this phenomenon to be well marked, particularly in the case of Lee. The sounds accompanying this impulse appear to be susceptible of great variation, owing in all probability to the depositions which take place in the interior of the sac, or to the variations of its aperture which occur in the progress of the disease, influenced, also, by the greater or lesser velocity of the circulation at different times.

That two sounds may be heard in an aneurismal tumour I can have no doubt, from my own observations and those of others. The causes of these sounds are not yet fully understood. From the experiments of Magendie,* it would appear that sounds of different intensity may be produced by the forcible injection of fluids through tubes of different calibres, and may be still further modified by pressure exercised on their exterior. Whether in the case of the aneurismal sac two sounds

* Lectures in the *Lancet*, 1835.

may be produced by the action of the parietes of the tumour itself on its fluid contents requires the admission of a degree of elasticity in these parietes, which, perhaps, we are not authorized to assume in the present state of our knowledge. The subject, however, is well worthy of consideration. Elasticity, we should recollect, is one of the physical properties of all organized matter ; and we have no *certain* grounds for supposing that the walls of a *false* aneurism are deprived of it. In order to clear up this point, it would be useful to examine aneurisms occurring at a distance from the centre of the circulation, as for instance, popliteal aneurisms. If in these cases a double sound could be clearly heard, it would not only throw light upon this subject, but might also be urged as an objection to the theory recently adopted by Magendie* to explain the sounds of the heart, as we can scarcely conceive any analogy between the physical conditions which this distinguished physiologist states are necessary for the sounds of this organ, and those that we find in the case alluded to. As I have not been able, however, since I thought of this subject, to examine a case of an aneurism in the extremities, I am at present obliged to confine myself to conjecture.

It will be perceived by reading these cases, that no assistance was obtained by the aid of percussion. This must necessarily be the case whenever the tumour is situated in contact with the vertebral column, and has not attained any considerable size ; under such circumstances, and if the lungs are healthy, a clear sound will be obtained anteriorly, and whatever dulness is perceptible posteriorly, may be with reason attributed to the column itself. When, on the other hand, the tumour has reached such a size as will necessarily induce dulness on percussion, the disease will, in all probability be evidenced by other and more remarkable phenomena. This observation will also apply to aneurismal tumours of the thorax in

* Lectures in the Lancet, 1835.

their incipient state wherever situated, but is more obvious in the instance alluded to.

In the second case, a purring tremour in the situation of the impulse posteriorly was very perceptible, when the ball of the thumb was pressed firmly down on the tumour, and could not be detected in any other part of the chest. It was perceptible when the respiration was discontinued. This sign, however, was not so remarkable in the other cases; and we know that it does not necessarily accompany the development of aneurisms in all stages of their increase. It ought, however, to be taken into account, when it occurs at a distance from the heart, and can be proved to be unconnected with any lesions of the respiratory function, or with a disease of the heart.

With reference to those symptoms which, in the language of systematic writers, are called "general," many differences must of course occur, according to the situation which the sac occupies. It will be observed, for instance, that in those cases no assistance was derived from a difference in the radial pulsations, or from numbness or œdema of the upper extremities. The absence of these symptoms, whenever the physical signs of an aneurism are strongly marked, may, perhaps, lead us with more certainty to a knowledge of the part of the vessel which the disease occupies, and also to the progress it is making. This is so obvious from considering the anatomy of the aorta, that I need not here make any lengthened observations upon it. In fact, when we have the physical signs above adverted to, and those general symptoms absent, we must infer that the tumour is below the origin of the great vessels going to the head and upper extremities; and if, in the course of the disease they make their appearance, we may infer that the sac is expanding upwards, and exercising a pressure on them. The same observation will apply to the absence of numbness and œdema of the upper extremities.

The violent paroxysm of dyspnœa was one of the most remarkable circumstances attending these cases; but when we

reflect on the number of sources from which this symptom will arise, we must see how uncertain it is, when taken by itself, to indicate the existence of an aneurism. That in the disease in question, other circumstances, besides the mere pressure of the tumour on the bronchial tube, concur to its production, appears to be evident from several considerations. I have already detailed a case where a violent and almost uncontrollable dyspnœa arose from the contact of a solid tumour, without producing any diminution of the calibre of the tube, at least none that was appreciable from examination after death. The occurrence of dyspnœa has been particularly adverted to by Dr. Graves, in one of his Clinical Lectures,* when treating of aneurisms in the thoracic cavity. Among many original observations upon this point, Dr. Graves remarks, that independently of the sensation of distress which arises from a portion of the lung being deprived of air, owing to the narrowness or obliteration of the tube going to it from pressure, other causes may be assigned for the dyspnœa and pulmonary irritation. He conceives that in such a case a portion of the lung undergoes changes analogous to those of the whole lung in the case of asphyxia; in this instance the blood from the right side of the heart ceases to be properly aerated, and stagnating in the lung, renders it engorged, and hence the secretions and exhalations are altered and unnatural, from whence arise, in addition to dyspnœa, irritation, cough, and expectoration. This reasoning, which appears difficult to disprove, may be applied to account for the constantly increasing pulmonary irritation which was observed in some of the cases I have mentioned, particularly in the last, where the expectoration in the end was decidedly purulent. We must not, however, neglect to take into account, as I have just observed, the many other causes of this phenomenon. That it depended, in the case I have mentioned of the woman

* Dr. Grave's Clinical Lectures,—Renshaw's Medical and Surgical Journal, Lecture 5th.

White, on the irritation of the nerves which surrounded the tumour, will, I think, be evident from considering the effects which follow the mechanical irritation of the nerves going to any particular muscle. We know that in such an instance spasms of greater or lesser violence will be the necessary consequence; and applying this reflection to the case under consideration, it will not be difficult to perceive, that the irritation of an osseous spicula on the phrenic nerve must have produced violent spasms of the diaphragm. If we adopt, with some physiologists, the opinion, that the bronchial tubes and the lungs themselves are endowed with contractile properties, the irritation of the nerves composing the pulmonic plexus would still further have aggravated the dyspnœa. Perhaps we might extend this explanation to account for the violent dyspnœa which is often one of the earliest symptoms of aneurisms in the thoracic cavity, recollecting that every deposit in the coats of the aorta, particularly an osseous one, will prove a source of irritation to the nerves with which it may be in contact; but these deposits most frequently precede the development of the disease.

The difficulty of swallowing is more likely to be experienced in those cases where the disease occupies the transverse and descending portion of the arch, than elsewhere. In this situation the œsophagus is more fixed, as it were, than in any other portion of its course, except where it passes through the diaphragm. From its comparative mobility, in the upper and lower portion of its course, it may in a great measure elude, for a considerable time, the pressure of the tumour. When this symptom does occur, it only becomes valuable when taken in conjunction with the physical signs, and of course cannot be relied upon if it occurs as an isolated phenomenon. The importance, in such a case, of being able to ascertain its dependence on the pressure of an aneurismal tumour, is obvious from the fact of probangs having been passed down in this disease,

under the supposition that the stricture was unconnected with it.

Among the general symptoms turgescence of the left jugular, in particular, is usually alluded to by authors. This symptom occurred in the three cases I have given; but as the tumour in each of them was at a considerable distance below the vena innominata, I am somewhat at a loss to conceive how their pressure could have influenced the circulation of the blood through it. The idea that suggests itself to me is, that the tumours might have produced an impediment to the aortal circulation, by which the arch would be over-distended, and would hence in its turn produce a pressure on the vena innominata. Should this supposition prove to be well-founded, we might have this symptom, although the aneurism were situated at a considerable distance from the vein.

The result then of these cases, together with those already published, particularly by Dr. Stokes* and Bertin,† proves that we are in possession of a number of physical signs, which, when attentively studied in connexion with the general symptoms, will lead us to a knowledge of this obscure disease, even before it has made any considerable progress. The necessity of taking every phenomenon into consideration, is obvious. We should recollect that our diagnosis ought never to be founded on one or two, but on a series of observations, carefully noted and compared with each other.

I have before mentioned that there is a portion of the aorta where some of those signs must necessarily be absent. As far as the different portions of the arch of the aorta are concerned, the diagnosis of aneurism of the vessel may be said to be in a great measure rescued from the obscurity in which it was formerly involved, and for which we are much indebted, amongst others, to the observations of Dr. Stokes. But when we come to con-

* Dublin Medical and Surgical Journal, vol. v.

† Observations 37 and 38, *Maladies du Cœur*.

sider the signs and symptoms we are able to collect when it occurs in the remainder of its course in the thorax, we find that they are diminished in number, and are often so feebly characterized, as to escape our notice. It may be superfluous, perhaps, to give an example in proof of this assertion, when so many are already on record. The following case, however, which occurred at the Whitworth Hospital, is so much in point that I will here mention it. The case was taken by Mr. Mayne, who was Clinical Clerk at the time the man entered the Hospital. I had not myself an opportunity of examining the patient. I shall give a very condensed account of it from the notes furnished to me by Mr. Mayne.

Laurence Duffy, aged 43, admitted 12th July, 1833, states he had been healthy all his life, until about nine months previous to his admission, when he began to experience a difficulty in swallowing, the increase of which induced him to apply for assistance. When questioned, he complained of difficulty in swallowing, which he referred to the centre of the sternum, where the effort was attended with pain followed by vomiting. Fluids passed down without difficulty; his bowels were constipated; the chest sounded well throughout; the respiration over its entire extent was perfectly natural. His bowels were freed by a calomel bolus, and purgative mixture. A slight cough which he had on his entrance, altogether disappeared for seven days after his admission, and no symptom whatever was complained of, but the dysphagia. He died suddenly on the night of the seventh day from his admission.

On dissection an aneurism was found corresponding to the fifth and sixth dorsal vertebræ, about the size of an orange, and it had burst into the right pleura. The tumour had slightly bent the œsophagus, which formed a curve, the concavity towards the sac.

Here then is an instance where, if we were to rely on the general signs, we should have had but one to excite our suspicions of the disease; and this should lead us, in all cases of long-

continued dysphagia, to institute an accurate examination for the physical signs of aneurism. A question then naturally arises; what are we to expect from such an examination, when an aneurism exists in this situation? It will be obvious that when the mouth of the sac is situated below the fourth dorsal vertebra, we cannot expect to find the same modifications of the respiration as those above mentioned. I mean this remark to apply to the incipient stage of the disease, for when it is considerably advanced the expansion of the sac upwards may of course produce pressure on either of the bronchial tubes, but even such an occurrence could not happen for a considerable length of time, when the tumour is situated opposite the eighth or tenth dorsal vertebra. It might perhaps be important to observe in such a case, whether the patient complained of pain on deep inspiration at the postero-inferior portion of the lung, or whether pains resembling those of pleurisy exist about this situation, for if the sac should contract adhesions to the pleura, it might not be unreasonable to expect pains similar to those that precede the advance of tubercles to the surface of the lung. When the sac has so far increased as to produce an absence of respiration in any considerable portion of the lung, the nature of the case will be in all probability apparent from other symptoms.

On reflecting upon the symptoms which would attend an aneurism so low down in the thorax, I at first imagined, that if the tumour produced an impediment to the aortal circulation, we might be able to ascertain it by the feeble impulse of the abdominal aorta, when the stethoscope was pressed firmly down upon it, some way above the umbilicus, but on considering the cases that have been published of obliteration or contraction of this vessel, I am not inclined to suppose that this phenomenon would exist. Many cases of such a change in the artery, as I have mentioned, are now on record. The latest published is in an interesting communication from Mr. Nixon, in the fifth volume of the *Dublin Medical Journal*, where copious references

are made to those previously noticed. From examining the plates which illustrate these contractions of the vessel, it will be seen that the aorta immediately below the constriction is abundantly supplied by collateral vessels, and no perceptible diminution of the calibre of the tube can be recognized. It is remarkable that this phenomenon has occurred in so many cases, near the situation of the ductus arteriosus, and it may become a question for further consideration, whether the process established by nature for the closure of that tube at birth, may not be extended to the aorta in its vicinity, and thus constitute either a congenital malformation, or establish a predisposition to aneurism in this part of the vessel.

The collateral circulation, I have alluded to, is attended with such an enlargement of the vessels that carry it on, that I was in hopes we might be led to infer the existence of the stricture, by attending to the increased pulsations in these arteries; but unfortunately, they are so numerous and deeply seated, as to be without the reach of any means we can apply to discover their pulsations. In all probability, also, should the closure occur from the pressure of an aneurism, these changes in the collateral vessels will be a gradual process, so that no sudden diminution of the pulsation of the vessel could be discovered below the stricture. The principal alterations that occur in these cases, are in the intercostal arteries, and their anastomosis with the mammary, &c., as is well seen in a plate in Meckel's Archives, 1827. The case of constriction, published by Meckel, occurred about the situation of the ductus arteriosus. It was accidentally discovered in the body of a patient, who died at Bonn, but of whose previous history nothing could be ascertained. In the plate which illustrates this lesion, and for the inspection of which I am indebted to Dr. Graves, who directed my attention to the case, these arteries are seen remarkably developed and tortuous, but as I have just observed, they would be too deep from the surface to enable us to recognize their pulsations during life.

In concluding these remarks, I would wish to direct attention

to the obscurity which still attends the diagnosis of aneurism of the inferior descending portion of the aorta, an obscurity which does not attach in so great a degree to aneurisms of the different portions of the arch. Since I have entered on the investigation of this subject, I have not been able to examine a case of the disease in this situation, but it is not improbable that those who have, will be enabled by their observations to elucidate this interesting point of pathology.

As far as I am at present enabled to offer an opinion, the principal symptoms and physical signs on which I would be inclined to diagnose the existence of an aneurism in the situation I have just mentioned, would be as follows:

1st. An impulse limited in extent, and decreasing in intensity as the stethoscope is applied above or below the situation of the suspected tumour. This sign is more valuable, if it occurs on the right side of the spinal column, which is not the situation, anatomically speaking, where an impulse should be perceived.

2nd. A bruit de soufflet or a bruit de râpe, heard in the suspected tumour, and not observable in any other considerable portion of the aorta or in the heart. It is necessary in every instance to examine the heart, for within these few days, I have met with a case, in the Whitworth Hospital, where a loud bruit de râpe accompanies the second sound of the heart, this bruit is heard down the spine along the course of the aorta. It is heard also in the carotid and brachial arteries, even to the elbow-joint. I have satisfied myself that in this case a double sound is heard in these arteries. The name of the individual in whom these phenomena occur, is William Connor, and several of the class of the Whitworth Hospital have heard both the bruit and the sounds in the situations mentioned.

3rd. The production of pain on pressing the vertebral column over the site of the impulse.

4th. The production of pain referred to a portion of the lung near the situation of the impulse, on a forcible inspiration.

5th. Dysphagia referred to some point below the middle third of the sternum, or to a point nearly opposite the impulse.

Lastly, it may be worth while to contrast the pulsations of the abdominal aorta in the epigastrium, with other arteries and with the impulse of the heart.

We should take into consideration also (provided the above signs are well marked) the evidence we may obtain with respect to the position of the tumour from the absence of some symptoms: such for instance as the non-existence of a laryngeal croupy cough; difference of pulsation in the two radial arteries; or numbness or œdema of the upper extremities.

I regret that the time afforded for getting this paper ready for the present number of the Journal, is not sufficient to enable me to consider this subject more at large. As, however, I have had no opportunity of studying the phenomena attendant on an aneurism in the part of the thoracic aorta to which I wish to draw attention, I feel it more prudent to reserve any further observations for a future opportunity. I am sensible of having left much concerning this interesting subject as yet untouched, but in giving the Cases above detailed, I shall be satisfied if they tend to strengthen our confidence in the diagnosis we are able to arrive at, by the additional aid of auscultation. The publication of such Cases is the more necessary, from considering the doubtful terms in which Laennec expressed himself concerning the value of the stethoscope, as applied to the diagnosis of the disease in question. We should, however, recollect, that the obscurity which the brilliancy of one mind is unable to dissipate, may be cleared up by the labours of many, and that the contributions of individuals for this purpose are, in the language of Abernethy, "like light shining from many quarters."

ART. XIII.—*Observations on Pericarditis.* By ROBT. MAYNE, late Clinical Clerk to the Medical Hospitals of the House of Industry.

[Read before the General Medical Society, Saturday, January 10, 1835.]

GENTLEMEN,

INFLAMMATION of the serous membrane of the pericardium is perhaps one of the most severe diseases to which the thoracic viscera are liable ; in fact, there is scarcely any form of local inflammation which produces such violent and dangerous effects upon the constitution at large. A very short time indeed may see a person on the point of death from the effects of pericarditis, who enjoyed excellent health previous to its accession ; and, in the great majority of instances, the patient is beyond the reach of assistance, before many hours have elapsed from the first appearance of the disease.

Notwithstanding the great interest which must have attached to this affection, ever since pathology and the practice of medicine have ranked as sciences, it is nevertheless astonishing to think, that so lately as the times of Laennec, its diagnosis rested on no better foundation than the conclusions which the *general* symptoms were capable of affording. The immortal discoverer of mediate auscultation was obliged to acknowledge himself incompetent, in most instances, to diagnose the disease ; and after such an admission from so high an authority, this Society, I am sure, will be fully prepared to admit the great obscurity which the symptoms of the affection in most cases present.

It is to our own days we must look for a grand addition to our knowledge in this particular species of diagnosis ; and it is to the researches of Dr. Stokes in particular, that the British faculty are indebted for the elucidation, if not discovery, of an important stethoscopic sign, which in many instances will completely remove the maze of difficulty, with which the investigation of this disease was before his time surrounded. Most of

my hearers will at once perceive that I allude to the frottement, or rubbing sound produced by the friction of the heart and pericardium against each other, at a time when *both* are covered with a layer of coagulable lymph, the result of inflammation.

The following is the description given of it by Dr. Stokes in the number of the Dublin Journal, for September, 1833: "This sound, which by some has been compared to the creaking of new leather, varies remarkably, not only in different cases, but also at different periods of the *same* cases. In some it closely resembles the bruit de soufflet produced by valvular disease, in others, there is the most complete analogy between it and the frottement of Laennec as arising from inflammation of the pleura; in some instances it is accompanied by the feeling of friction, when the hand is applied over the region of the heart, in others it is nearly allied to the bruit de rape of Laennec." Wherever this sign *does* exist, we may, with tolerable certainty, infer the presence of pericarditis; and as such, in skilful hands, it must be considered an invaluable guide in practice; but its absence by *no means* entitles us to conclude that the disease we have to deal with is *not* inflammation of the pericardium; the fact is, many cases will be met with in practice, when such a diagnostic mark will be sought after *in vain*; and not a few of them will be found to be, according to my experience, those in the early stages of the disease, when active treatment would produce the most decided salutary results, and when, consequently, a wrong diagnosis in the first instance would be attended with the greatest danger to the patient, and deepest regret to the physician.

It is principally then to ascertain the real value to which the frottement, as a diagnostic sign of pericarditis, is entitled, that the present paper has been written; and in prosecuting the inquiry, we shall be able to conclude, I imagine, that various circumstances are likely to interfere with, or even totally prevent the existence of frottement in the affection we are considering; that in some instances this sign will not be evident at any one

period of the entire disease, that in others it may readily be mistaken for similar sounds which are characteristic of other organic lesions; whilst in the majority of cases, it is only in a particular stage of the affection we can recognize it; and consequently, unless due attention be paid to general symptoms, we may commit serious mistakes, by relying implicitly upon a sign which is itself in many instances fallacious.

I shall now relate some cases of the disease, which occurred in the Hardwicke Hospital, within the last few months, under the care of Dr. Crampton, to whose instructions I am indebted for my first knowledge of the use of the stethoscope.

CASE I.—Lucy Duff, a strong-looking girl, ætat. 18, was admitted into the Hardwicke Hospital, 21st November, 1834, labouring under the usual symptoms of acute rheumatic fever, with which she had been suddenly attacked three days previous to her admission. The wrist and ankles were the joints particularly affected; she had no cough or dyspnoea, nor did the stethoscope give any indication of thoracic disease; she was treated pretty actively by general bloodlettings, and colchicum, from which she continued improving up to the morning of the 25th, when the following note was taken of her symptoms. Countenance greatly altered since yesterday, and has assumed an anxious expression; she was exposed to cold during the night, from the bed-clothes having fallen off, since then, the pains in the joints have been much less troublesome; but a degree of constitutional disturbance has supervened, which is truly distressing; complains of great tenderness in the epigastric region, which is particularly severe when pressure is directed up towards the pericardium; also a sense of weight about the region of the heart, which causes vast distress; has vomited frequently since morning; prefers the upright to the horizontal position; does not suffer from palpitation; pulse 130, small, wiry, and regular; region of heart sounds natural on percussion; impulse of heart very strong, but regular; the stethoscope indicates slight bronchitis over a considerable portion of the left

lung; respiration 37 in a minute; no unnatural sound accompanies the heart's action. From these symptoms pericarditis was immediately suspected, and very active treatment had recourse to, without loss of time; large detractions of blood, both general and local, were prescribed, and two grains of calomel with a quarter of a grain of opium, ordered to be taken every four hours.

26th. Symptoms same as yesterday, no frottement or unnatural sound in heart's region.

27th. For first time, frottement audible over the whole anterior surface of heart; it accompanies both sounds and is remarkably distinct; region of the heart still sounds well; epigastric tenderness somewhat relieved; mouth sore from effects of mercury; still some bronchitis over left lung.

29th. General symptoms greatly improved; phenomena in heart's region as at last report.

December 1st. Mouth very sore; anxiety of countenance gone, slept well, can lie in any position without inconvenience; no epigastric tenderness, or vomiting; action of the heart rapid; impulse natural; distinct frottement over upper region of pericardium, none at apex of heart where it was plainly audible at last report; region of heart still sounds tolerably clear; dyspnoea, and sense of weight in præcordial region completely disappeared.

3rd. Pulse, 120, regular; frottement completely gone; pronounced convalescent.

18th. Was suddenly attacked last night with great dyspnoea; states that her breathing has never been perfectly well since her last illness, and that for the last few days her feet have been slightly œdematous; she is now evidently very much oppressed; cannot lie down for fear of suffocation; pulse very rapid, irregular, and scarcely perceptible; surface quite cold; face swollen and bluish; lower half of both sides of chest completely dull, and without any respiration discoverable to the

stethoscope ; impulse of heart weak and irregular ; without frottement. She died same day.

Post mortem.—A quantity of greenish-coloured serum amounting to several pints in cavity of peritonæum ; no lymph on surface of membrane, or increased vascularity ; extensive effusion of greenish serum into both sides of the thorax, but without false membranes or other indication of pleuritis ; lungs sound, with the exception of the mucous membrane, which was greatly congested both in the trachea and larger bronchial tubes. Pericardium appeared larger than natural, it felt also thicker than usual : on cutting into it, the membrane was found intimately adherent to the apex and sides of heart ; the union at the apex, in particular, was so close, that it was difficult to separate them without the assistance of a scalpel ; along the side of the heart the adhesion was not so perfect, being affected merely by a cellulo-vascular false membrane, which could be ruptured with facility. The anterior surface of heart, as also the parietal layer of serous membrane corresponding to it, was covered with a dense, firm, granulated, false membrane ; this latter was rough and vascular, and presented on its free surface, numerous tubercular elevations, of the colour and general appearance of granular fat, but much harder, and of firmer consistence. There were $\frac{3}{4}$ iv. or v. of sero-purulent fluid contained between the heart and pericardium in this situation, and accurately circumscribed by the adhesions mentioned above ; the posterior surface of the heart was connected, throughout, to the corresponding pericardium by short, flocculent bands of recently organized lymph.

CASE II.—Mary Quigly, æt. 35, was attacked on the 31st of July, 1834, with pains darting through the thorax in various directions ; these were quickly followed by a short, frequent, and dry cough, of a peculiarly distressing character, with considerable dyspnœa. These increased for two days, during which little was done to relieve her, and on the 2nd of August she was admitted into the Hardwicke Hospital. When first visited she was sitting up in bed, leaning forward, her countenance ex-

pressive of great distress, and her respiration laboured; lips bluish; face swollen and purplish; a cold clammy sweat covered the head and upper part of the body; extremities cold; pulse 140, indistinct, irregular, and intermittent; all her distress was referred to the epigastric region, a little below and to the left of ensiform cartilage, where the slightest pressure in the direction of the pericardium caused great anguish; no tenderness in hepatic region, or other part of the abdomen; no vomiting; tongue moist and covered with a whitish fur. Anteriorly the chest sounded well, except in the region of the heart, where it was perfectly dull; posteriorly, over the inferior half of both lungs, the chest was perfectly dull, and no respiration audible; no oëgophony or crepitus could be detected any where. To the stethoscope the action of the heart appeared remarkably irregular; the heart itself did not seem to strike the thorax with vigour; and its impulse was exceedingly weak, and sometimes quite imperceptible; both sounds of the heart could be distinguished, but there was nothing approaching to frottement or soufflet audible. She died six hours after this report was taken.

Post mortem.—Liver and stomach healthy; no morbid appearance of the peritonæum; the cavity of each pleura contained flakes of lymph above the base of the lungs; the membranes themselves were vascular, and a quantity of sero-purulent fluid was found in both cavities; pericardium greatly distended with liquid, similar in appearance to what was contained in the pleuræ; the heart was studded in several places with fragments of false membrane, which appeared partly detached from it, and in the intervals the membrane itself presented slightly vascular patches.

The first conclusion we would be likely to draw from a review of the above cases is, that nothing can possibly be more incongruous than the assemblage of symptoms which they present to our notice; but on considering them attentively, we shall find, that these diversities denote accurately the

changes of structure which the pericardium had undergone, and can be explained by the appearances which serous membranes present when under the influence of inflammation. It will be well, for sake of perspicuity, to advert very briefly to the changes which the pericardium undergoes in inflammation of its serous membrane, in order that you should clearly comprehend the connexion which exists between these alterations of structure, and the symptoms which result from them. It is not my intention to describe at large the appearances found in persons who have died of pericarditis, as that would occupy more space than is consistent with the limits of this paper, but merely to remind you, that the first effect of inflammation is to produce a preternatural vascularity, and also generally a degree of dryness of the membrane; after this state has continued for an uncertain length of time, the surface of the membrane becomes covered with a layer of coagulable lymph, which is exceedingly variable in extent and thickness; sometimes it occupies the entire free surface of the membrane, at others it exists in patches; occasionally it is tenacious and adherent, and not unfrequently, on the contrary, perfectly loose and flocculent. After this a more or less extensive effusion takes place into the cavity: it consists of serum, which presents different shades of colour, according to the particular circumstances of each individual case.

In the great majority of instances this is the order in which these various changes occur, and they appear to me to follow one another in regular succession so generally, that we may fairly divide the disease into three distinct stages. These may be easily recognized in practice, and by attending to them we shall get rid of much of the obscurity which would otherwise perplex us in arriving at a diagnosis.

The first stage is that which corresponds to the period, during which the membrane is simply preternaturally vascular and dry, but without any secretion of lymph on its surface. The second is that in which there is an exudation of lymph, either simply, or at least conjoined with a *small* quantity of serum.

The third is that in which, in addition to lymph, there is an extensive liquid effusion. The attention of the Society is particularly requested to this important division, as one of the stages here laid down has not been adverted to by any author with whom I am acquainted, and as, by a reference to it, the symptoms which appeared so conflicting, in the cases submitted in this paper, can be explained, and their apparent diversities reconciled.

The case of Duff presents us with an excellent example of the first stage ; from it we learn, that though the commencement of the inflammation was clearly traceable to the morning of the 25th of November, and though she presented the general symptoms of the disease, *namely*, epigastric tenderness, sense of weight about the region of the heart ; vomiting ; great dyspnoea, and general distress, from the same date ; yet no frottement accompanied the heart's action, nor was any appreciable dulness to be discovered in its region, for at least thirty hours after the first accession of the disease. *Again*, during the same period, the action of the heart was rapid but regular, its impulse strong ; and the pulse itself, though rapid and wiry, was not intermittent. When we reason on these symptoms, they are, after all, just what might be expected from the state of the membrane, which, we may presume, existed ; there was no lymph on its surface, therefore *no* frottement accompanied its action ; there was *no* effusion into its cavity, therefore a *clear* sound was elicited on percussion ; and the impulse communicated to the ear was strong and regular, inasmuch as there was *no* fluid in the sac to clog the motions of the heart, and prevent its impinging with vigour against the parietes of the thorax. This case, if we consider its symptoms from the second day to the eighth, also affords an example of the second stage. By referring to it we find that a frottement became audible over the entire region of the heart about thirty hours after the commencement of the affection, this accompanied both sounds, and was remarkably distinct ; the region

of the heart still sounded tolerably clear, showing that the secretion was of moderate extent, and therefore still allowed the surface of the heart and pericardium to remain in contact, and consequently in the best possible condition for producing this peculiar sound. The case last read, or that of Quigley, on the contrary, points out strongly the characters of the third stage; from it we learn that the marks of an embarrassed circulation were plainly perceptible; the pulse rapid, irregular, and intermittent; the action of the heart irregular; its impulse weak, and conveying the sensation as if it did not strike the thorax. All remarkably tallied with the fact, that the region of the heart was dull, owing to an extensive liquid effusion. Finally, all was easily explained by adverting to the fact, that so much fluid in contact with the central organ of the circulation, must have completely interfered with its actions, and eventually altogether prevented the proper discharge of its functions. The post mortem examinations, in both cases, show how accurately appearances coincided with these suppositions.

The next case I am about to detail exhibits, in a remarkable manner, the two first stages of pericarditis. It is also an example of recovery, and shows that the disease may terminate favourably, without going on to the third stage, or that of extensive effusion.

CASE III.—Mary Winters, æt. 12, a delicate-looking girl, was admitted into the Hardwicke Hospital, in the month of October, 1834, for scarlatina; the disease ran its course without any remarkable symptoms, and she became convalescent in a few days. She remained apparently well until the 10th of November, when she was suddenly attacked about six in the morning, with great dyspnœa and sense of suffocation. She was seen three hours after the above symptoms commenced, when the following note was taken. Countenance anxious; dyspnœa extreme; sits up in bed, leaning very much forward; cannot lie down for fear of suffocation; she points to the epi-

gastrium as the place where all her distress is situated ; is nearly unable to articulate from the intense dyspnoea ; has a short, dry, teasing cough ; does not of herself mention any uneasiness about the region of the heart, but when closely questioned says she suffers from palpitations ; has great tenderness in the epigastrium, particularly when pressure is directed up towards the pericardium ; pressure of the ribs over heart causes exquisite torture ; no vomiting ; tongue moist and whitish. The stethoscope gives no indication of pulmonary disease. To the eye the impulse of the heart appears very great, and contrasts remarkably with the pulse at the wrist, which is very rapid and small. It is also strange, that the patient's complaints should not be more directed to the palpitations, where the heart's impulse is evidently so tremendous. The region of the heart sounds well ; the impulse of the heart communicates a considerable shock to the ear of the auscultator ; respirations forty in a minute ; sounds of the heart rapid, but unaccompanied by frottement. Active treatment was resorted to immediately ; extensive depletions, with calomel and opium every third hour.

11th. Breathing somewhat relieved ; no frottement or soufflet in any part of the heart's region.

12th. Frottement detected this day, for the first time, in the region of the heart. It exists over the entire surface of that organ, but is most distinct at the apex ; it accompanies both sounds, and cannot be heard at any distance from the heart itself : no appreciable dulness in the region of the heart, beyond what might be expected in a state of health. Mouth slightly touched by mercury ; general symptoms relieved ; pulse 100, but regular ; palpitations less troublesome ; dyspnoea much relieved.

13th. Strong mercurial foetor ; gums very sore ; tenderness in epigastrium gone ; frottement very distinct ; pulse 115 ; pills to be omitted.

Tinct. Digitalis gutt. x. ter die ex Mist. Camph. ℥i.

18th. Has been up for last two days, and appears quite convalescent. Dyspnœa, cough, epigastric tenderness, and palpitations completely gone. No dulness in the region of the heart more than natural. Pulse 100, regular; no frottement in any part of the heart's region; action of heart regular; impulse natural. Discharged from hospital on the 20th, quite well.

It may be asked here, how does this first stage of pericarditis terminate? is it by verging gradually into the second, or does resolution in some cases take place? I can, of course, only answer for the facts which have actually come under my own observation; and in both cases, where this first stage clearly existed, it was quickly followed by the exudation of lymph. This is, however but a negative proof against the possibility of so desirable a termination as resolution.

In other serous inflammations the exudation of lymph, by causing adhesion of the opposite surfaces of the membrane, is generally the most desirable result that can be expected; and is, in fact, a salutary effort of nature to effect reparation; but in the case before us, such a termination is not to be wished for, inasmuch as adhesion of the pericardium to the heart lays the foundation of incurable disease of the organ itself, by impeding its action, and calling on it for increased efforts to overcome the resistance offered to its contractions. The case of Duff, too, shows that extensive and rapidly fatal dropsical effusions are sometimes the consequence of this very lesion. From this view of the subject the society may easily understand of how great importance it would be to determine accurately the question, whether or not complete resolution of the first or congestive stage of pericarditis may be expected. Unfortunately it will always be most difficult to prove that resolution does actually occur in these cases, as the first stage of the disease seldom in itself proves fatal, and the symptoms during life, at so early a period, are too equivocal, to convince the sceptical of its existence. The second stage of pericarditis may

terminate in various ways: the patient often dies at this period. It may run on into the third stage, as has been explained above, and as some of the cases brought forward to-night exemplify. It frequently does end in perfect adhesion and complete obliteration of the cavity of the pericardium, and I have strong reason to imagine it may terminate by absorption of the effused lymph, and so a *permanent* recovery ensue. I have endeavoured above to show how unstable a cure is that which follows adhesion; it is unnecessary then to add how desirous we should be of promoting absorption, should such a process be possible: I cannot see why we should despair of such a result: analogy warrants the supposition. In iritis, for instance, we sometimes see lymph absorbed, and may we not hope for similar effects in a membrane belonging to the same class?

The authority of Andral also bears me out in this opinion: for he says in his *Pathology*, vol. i. p. 593, by Townsend and West, "Some facts would lead us to conclude, that the false membranes of serous cavities may be absorbed, and disappear after having existed for a certain time."

It may be asked here, how are we to distinguish, in the living subject, the case when adhesion takes place, from that in which the effusion of lymph is followed by extensive secretion into the cavity? as in both cases the frottement disappears. Doctor Stokes has given us able diagnostic marks, which I shall now lay before the Society: "If adhesion takes place the frottement ceases rather suddenly, while the sound, on percussion, continues clear; the impulse also remains strong, and is unaccompanied by the irregular intermittent pulse, and general sinking of the vital powers, so characteristic of extensive effusion. But if the effusion increases, or if, in other words, the third stage supervenes, we have increased dulness corresponding to the disappearance of the frottement."

It has been stated above, that the frottement is not audible in the third stage of pericarditis, we are now to explain why

this should be the case. Three different causes may be enumerated: 1st, the quantity of fluid in the pericardium prevents the opposite surfaces of the membrane coming in contact. 2nd. Very generally the lymph, which previously covered the membrane at this period of the disease, breaks down and becomes diffused through the fluid, instead of adhering to the surface by which it was secreted; so that, even though the heart and pericardium remained in apposition, no frottement could result. 3d. The vital powers are so weak that there is not sufficient energy in the heart's action to produce frottement, even granting the apposition were perfect. The first cause laid down here is by far the most efficient; but all of them may contribute, in certain instances, to account for the phenomenon.

The third stage of pericarditis is, in most instances, fatal. However, the fluid may even still be absorbed, and a cure result. This process is indicated by a gradual subsidence of the dulness, an amelioration of the general symptoms, and sometimes a reappearance of the frottement, when the opposite surfaces of the membrane are again approximated.

The following cases will exemplify many of the positions which have been now assumed.

CASE IV.—Ellen Hore, æt. 20, a strong looking girl, was admitted into the Hardwicke Hospital, on the 26th of August, 1834, for rheumatic fever, under which she had laboured for five days previous to admission. The chest was explored carefully, but the stethoscope furnished no indication of thoracic disease. Bleeding, both general and local, purging, and colchicum were employed with benefit, and on the 28th the report taken was,—pains in joints almost gone; pulse 90 and soft; tongue cleaning; bowels free.

29th. Note taken was, countenance greatly altered since yesterday, and anxious; suffers much from a sense of weight about the region of the heart, which attacked her suddenly at one o'clock this morning; has no cough or dyspnoea; some

tenderness in epigastrium ; does not complain of palpitations, though the heart's action is evidently much more violent than natural ; region of heart slightly duller than natural ; impulse very considerable ; pulse 130, small and regular. The stethoscope indicates a distinct frottement all over the region of the heart ; it accompanies both sounds, and conveys the idea of two moist surfaces rubbing against each other. Same treatment as in the above cases.

30th. Countenance more tranquil ; sense of weight in heart's region less distressing ; impulse less violent ; frottement greatly modified since last report ; it now approaches in character the bruit de soufflet ; pulse 115, regular.

31st. Mouth sore ; mercurial feter.

September 1st. Sense of weight in the heart's region increased ; considerable dulness ; frottement entirely gone from the apex of the heart, but still continuing about the base of that viscus ; impulse lessened considerably ; pains in joints quite gone ; pulse rapid and feeble.

Vesicat. regioni Cordis.

3rd. Pains come back to extremities ; countenance more tranquil ; pulse 120, soft and regular ; tongue cleaning ; uneasiness in the heart's region relieved by blister ; dulness less than at last report ; frottement again audible all over the heart's region ; dulness declining ; impulse as before.

5th. General appearance greatly improved ; tongue cleaning ; slept well last night ; præcordial distress subsided ; an obscure roughness still accompanies the second beat of the heart ; frottement gone.

9th. Pulse 116 ; dulness in the heart's region rapidly disappearing ; action of the heart natural.

Last note taken of this case was on the 20th of November, six weeks after she was pronounced convalescent. Has completely got up her looks again ; still complains of slight pains in the joints ; no palpitations ; respiration over the entire

chest natural ; region of the heart sounds natural on percussion ; pulse 90, and regular ; appears in rude health.

This case presents many remarkable features, it shows accurately the transition from the second to the third stage. It also affords an example of the complete absorption of an extensive effusion, or in other words a favourable termination of the third stage of pericarditis ; and a perfect cure the result. By a reference to the case we find, that on the morning of the 1st of September, the frottement, which had previously existed all over the heart's region, was now confined to its base, while the dulness had increased perceptibly since last report ; this led to the idea, that the apex of the heart was separated from the pericardium by an increased effusion, while about the origin of the great vessels, the surfaces were still in contact, and allowed the rubbing sound to be produced. On the 3rd, the dulness had again in a great measure subsided, and accordingly the frottement was again distinct, showing that the disappearance of the fluid, had once more allowed the apposition of the opposite surfaces of the membrane. Finally, on the last report, we find the frottement completely gone, and the sound clear, indicating either adhesion, or total absorption of both lymph and serum, without the agglutination of the opposite surfaces of the membrane. Which of these two occurrences has actually taken place it is not for me to assert ; but the pulse having come down to the natural standard, the patient appearing in perfect health, and having continued such a length of time perfectly free from any heart affection, would seem at variance with the supposition of universal adhesion.

CASE V.—The next case I shall relate is that of Peter Byrne, æt. 35, admitted into the Hardwicke Hospital, 15th of August, 1834. He was a strong-looking man, and had never suffered from illness until five days previous to admission, when he was suddenly seized with a darting pain in the small of his back, which caught his breath, and caused great distress ; it occupied the lumbar regions, and corresponded nearly to the situation of

the kidneys. When first seen in Hospital, the following note was taken : countenance expressive of great suffering ; all his distress referred to the lumbar region ; no cough or palpitations ; considerable epigastric tenderness, though not complained of unless his attention be directed to it, by the application of pressure ; no vomiting ; tongue moist and white, orthopnoea ; respirations 44 in the minute ; left side of the back dull from top to bottom ; loud oegophony audible all over it ; region of the heart sounds natural on percussion ; a distinct frottement accompanying both sides of the heart exists over its entire extent ; impulse considerable ; pulse 135, small, and regular. Diagnosis of pleuritis and pericarditis was immediately given ; most active treatment pursued ; extensive blood-lettings, both general and local, practised, and calomel with opium freely administered.

16th. Respiration greatly hurried ; pulse 140, variable, feeble, and intermittent ; tongue dry and brown ; sordes on teeth ; considerable dulness in the heart's region ; impulse of the heart greatly diminished ; to the auscultator its action appears weak and irregular ; frottement gone, except at the base of the heart, where it is still audible. He died a few hours after last report was taken.

Post mortem—A quantity of sero-purulent fluid in the cavity of the left pleura ; a flocculent false membrane closely adherent to the entire back of same lung ; pericardium greatly distended with fluid, similar in appearance to that found in the pleura ; there were numerous flakes and shreds of coagulable lymph floating loosely in the cavity ; the heart itself covered round its base with a layer of tenacious, flocculent, coagulable lymph ; the pericardium corresponding to this part was also covered with a false membrane ; the remainder of the heart was free from this coating ; the kidneys and other parts in lumbar region sound.

In this case the cessation of frottement about the apex of the heart, and the corresponding increase of dulness, presented phenomena precisely similar to those remarked in the last case ;

here also, we find the peculiar rubbing sound continuing about the base of the heart, after having subsided at the apex, just as in the preceding example. In the last case, however, our diagnosis was verified by *post mortem* examination, while in the former, our explanation of the successive changes observed, depends merely on the evidences afforded during life, but which are nevertheless sufficient in my mind to convince the most sceptical. There is another point of view in which this case is most interesting, viz., we had no conclusive general symptoms to direct us to the true nature of the affection; and yet the stethoscopic signs were of themselves quite diagnostic of both the pulmonary and pericardial lesions. It also marks accurately the transition from the second to the third stage, in fact the upper part of the pericardium was strictly in the second stage, while the lower afforded an example of the third.

It was formerly supposed that the frottement, which occurs in serous inflammations, is owing to the dry state which the membrane assumes from the suppression of its accustomed secretion, and that the rubbing sound is the result of the friction of two dry membranes against each other. To prove this notion incorrect, we have merely to consider, *collectively*, some of the cases which have been read this evening. In two of them we find this frottement did not take place during the first thirty hours after the commencement of the disease, or in other words the exact period at which we might suppose this dryness of the membrane prevailed, and in the case last recited, we find this peculiar sound exactly corresponding to the region, where the lymph was proved by necroscopic examination to have been situated. So that we have strong negative, as well as positive proof in favour of the opinion, that it in every instance depends upon the existence of lymph.

It may here be asked, are we justified in at once pronouncing a disease pericarditis, when the heart's action is accompanied by this frottement, or some of its modifications? We certainly are not; for on reflection it will appear, that similar

sounds may be produced by totally different organic affections, which circumstance must be a fruitful source of fallacy in the investigation. It has been stated above, that in some cases, the frottement is so completely modified as to become almost identical with the bruit de soufflet or bruit de râpe produced by valvular disease; confounding these two affections would evidently be fraught with the greatest danger. How then are they to be distinguished? We must again refer to the excellent paper of Dr. Stokes for information on this point. According to him these sounds in cases of pericarditis may be distinguished from those of valvular disease; 1st, by the sudden appearance of the phenomena in cases which presented no such signs a very short time previously; 2nd, by the short distance beyond the actual situation of the heart, to which they are perceptible; 3rd, by the great influence which local treatment exerts in modifying these sounds.

It is not my intention here to advocate the sufficiency of these diagnostic marks; on the contrary, my firm conviction is, that the investigation will in many instances be attended with the greatest difficulty, and even calculated to puzzle the most experienced physician. The exact nature of the bruit de soufflet and bruit de râpe, is as yet far from ascertained; they are found frequently in individuals, without organic disease of any part of the arterial system; so that until more accurate views are entertained as to their causes, and varieties, the distinction between *those* cases when they are produced by *other* causes, and *those* where they are the result of pericarditis, will be most difficult to ascertain. In the simple uncomplicated cases, by a little trouble we shall generally arrive at satisfactory conclusions, but it is far otherwise in those instances where we have organic disease of the heart present, and are doubtful whether pericarditis may have supervened. Here *all* the stethoscopic phenomena may be owing to the chronic alteration in the structure of the heart itself, and it must be impossible from *them alone*, to draw any inferences, which may not prove erroneous. But here it

may be inquired, does not the rubbing *sound itself*, when clearly developed in any part of the heart's region, amount to actual proof that the pericardium is inflamed? Even this is liable to fallacy, for it has been clearly ascertained, that when the neighbouring portion of the pleura is covered with lymph, frottement is produced in the act of breathing, which may be mistaken for that of pericarditis; a temporary suspension of the respiration, as Dr. Stokes observes, will usually serve to distinguish between these sounds, for if pericarditis be the cause, the sound will of course continue, but even in simple pleuritis, may not the mechanical impulse of the heart against the lung, when covered by inflamed pleura, produce a distinct frottement synchronous with the systole of that organ, and thus cause difficulty in the diagnosis, unless general symptoms are taken into the account?

The last case to which I shall allude, is that of Felix Shepard, who was admitted into the Whitworth Hospital, 22nd of July, 1834, labouring under acute anasarca. Shortly after admission he was seized with diffuse inflammation of the cellular membrane of the neck, which quickly extended all over the chest and abdomen; the parts affected were exquisitely tender; pulse very rapid and small; fever intense and of a typhoid type; he complained of some slight uneasiness about the heart, which led to its exploration, but nothing peculiar was discovered by the stethoscope; the action appeared very rapid, and weak, but there was no frottement or other unnatural sound audible. He died on the second day after the appearance of the diffuse inflammation.

On examination, the pericardium was found to contain 3 vii. vel viii. of thin pus. There were no false membranes discovered in the cavity; the membrane itself presented some vascular patches.

This is a most important case, for many reasons, but as the time of the Society has been already sufficiently trespassed upon, I have avoided mentioning more of the facts, than actually relate to the pericardial affection. The principal peculiarities ob-

servable in it are these ; 1st, we have such an intense degree of inflammation, that pus has actually been formed in the cavity, which I need scarcely say is a very rare form of pericarditis, and this unaccompanied by the exudation of lymph ; 2nd, there was no one general symptom of the disease, which might not have been attributed to the cellular inflammation, and consequently the pericarditis here must be considered nearly latent.

But what I am principally anxious to draw the attention of the Society to is, that during its *entire* course the stethoscopic sign of pericarditis was *never* developed ; and this was fully accounted for by the fact, that no lymph had been secreted, and consequently the conditions necessary to produce frottement were not fulfilled.

I have still the notes of five other cases of pericarditis in my possession, but as this paper has already run out to a great length, it is not my intention to relate them at present. In those which *have* been detailed, I have avoided going at any length into the treatment ; as this paper was written *merely* with a view to the diagnosis of the disease, and the introduction of any irrelevant matter must necessarily have limited our consideration of its immediate object.

All my hearers must now be convinced, that the signs furnished by auscultation, *are (taken by themselves)* insufficient for the purposes of diagnosis. We shall now turn our attention to the *general* symptoms, and see whether great advantage may not be derived from their attentive consideration. The first of these which presents itself for our notice, is the epigastric tenderness ; it is generally very characteristic, and may be looked on as the most unequivocal *general* symptom of the affection. Out of eleven cases of this disease, seen in *all* its various stages by the writer, *it* was observed in ten ; and in five formed the principal part of the patient's sufferings ; it did not appear peculiar to any one period of the complaint, but in every instance continued unabated, until the inflammation was to a certain extent subdued. This symptom, however, is common to many

other affections ; may we not, therefore, actually be led into error, by taking it as a criterion? In my opinion a very slight attention to its peculiarities will in every instance enable us to distinguish it. In pericarditis the tenderness is confined principally to the left side of the epigastrium, and is most intense when pressure is directed up towards the pericardium, underneath the false ribs ; it is also more circumscribed and confined to a smaller space than that which is the result of abdominal disease. The great constitutional disturbance which attends it, is also a valuable diagnostic ; and finally, we have not the peculiarities of the tongue, the intolerable thirst, the constant nausea and vomiting, the avidity for cold drinks, the distressing hiccup, which so constantly attend gastritis.

The next symptom to which I shall advert is dyspnoea : it also existed in ten out of the eleven cases. There were two different forms of it observed : in one it formed the chief subject of the patient's complaints ; while in the other, it was not noticed by the sufferer, even though the respirations were as many as thirty-five or forty in a minute. Here again it may be alleged, that dyspnoea is present in every chest affection, and therefore should be entitled to but little attention. It is true, taken singly, it is of little avail ; but in conjunction with the negative signs furnished by auscultation, it becomes of the greatest value ; for if the lungs be sound, and there be no other satisfactory cause assignable, the old "*argumentum a remotione ad positionem*" fixes it at once upon the pericardium. The pulse presents great varieties, and is therefore not entitled to much reliance ; however, a review of the peculiarities which it exhibited, in the cases before alluded to, may not be unacceptable, particularly as in general it was what might be expected from the state in which the pericardium existed. In ten of the eleven examples great rapidity of the circulation was common to all periods of the disease ; in some of these it has even amounted to 140, and rarely has it fallen below 120 in any. In the two cases where the first stage of the disease was

recognized, the pulse was very rapid, but regular and wiry. *In the second stage* the pulse presented some varieties: with one exception it was uniformly rapid. In by far the greater number it retained its regularity, in some it was accompanied by a peculiar thrill, and in two instances only was it intermittent.

In all the examples of the third stage which were presented to us the circulation was weak, small, irregular, feeble, and intermittent. Palpitations are a much more fallacious criterion than might *a priori* be expected; it is surprizing to see what tremendous impulse of the heart may exist, and yet not a complaint be uttered relative to it by the patient. In but a few instances out of the eleven were palpitations much complained of; in a far greater number a sense of suffocation and weight about the region of the heart, with a tightened squeezing feel, were peculiarly distressing.

The expression of countenance which accompanies this disease is most characteristic; it was observed in almost every instance, and although most difficult to describe, affords very valuable information to a practised eye.

It may be well to remark, that of the eleven cases so often mentioned, five occurred in individuals who had previously laboured under acute rheumatism. In four of these there was a marked metastasis of the inflammation from the extremities to the heart; while in one, the articular affection appeared uninfluenced by the supervention of the pericardial disease: at all events it would seem, that a translation of rheumatic inflammation is by far the most frequent cause of pericarditis, which should render our prognosis in these cases most guarded.

Having spoken so much of the *general* signs, it will be well to review briefly those which are furnished by auscultation and percussion.

The frottement has already been sufficiently considered; we shall therefore now turn our attention to the two remaining criteriæ, viz., the heart's impulse, and the character of the

sound elicited by striking the thorax. In both cases, when the first stage was recognized, the impulse was very great, so much so, as to give an unpleasant shock to the ear, and this was quite out of proportion to the strength of the impulse in the radial arteries.

In the second stage very generally, likewise, the impulse was increased; in some it was violent; in many considerably greater than natural; and in but one instance did the heart *fail* to communicate a shock greater than was consistent with health.

In all examples of the third stage which were presented to us, the impulse was irregular and intermittent, generally weak, and conveying the idea of fluid interposed between the apex of the heart and parietes of the thorax. The sound on percussion must be clear in the first stage, provided the views which have been advanced to-night as to its nature be found correct; and this exactly agrees with what was observed in the two cases related above.

In the second stage likewise a clear sound can generally be elicited; however in some rare instances the effusion of lymph will be so considerable, as to give rise to an appreciable degree of dulness. This occurred in two or three of the examples already referred to.

The third stage uniformly presents a degree of dulness, more or less considerable, according to the quantity of liquid contained in the pericardium. When, however, it is recollected, to how many causes this may be attributable, most of my hearers will at once perceive, that taken by itself this must be considered a very equivocal diagnostic.

Finally, Gentlemen, from what has been adduced this evening, we are justified, I imagine, in drawing the following conclusions:

1st. That pericarditis, in most instances, may be divided with advantage into distinct stages, which differ considerably, as well in general symptoms, as in stethoscopic phenomena; and

that a reference to such an arrangement is calculated to facilitate our diagnosis of the disease.

2nd. That in the present state of our knowledge there is *no* stethoscopic sign which can be considered pathognomic of the first stage ; which is the more to be regretted, as this is of all others the period at which most benefit might be expected from active antiphlogistic treatment.

3rd. That in the great majority of instances the second stage is accompanied by a frottement, or some of its modifications, which must be considered a grand addition to our knowledge in this species of diagnosis, that, when present, it affords nearly positive evidence of the existence of lymph on the surface of the heart, but is nevertheless liable to certain fallacies.

4th. That the *third* stage is not accompanied by frottement, but that the results of percussion afford us valuable assistance in *its* investigation.

5th. That some cases of pericarditis may run their entire course without the development of any stethoscopic phenomena.

6th. That the signs furnished by auscultation and percussion are, in many instances, inadequate to the purposes of diagnosis.

7th. That though the general symptoms considered separately, must be looked on as unsatisfactory, yet, if taken collectively, they are in general strongly characteristic of the affection.

8th, and lastly. That it is only by a careful comparison of the general with the stethoscopic signs that, in the present state of our knowledge, we can expect to arrive at accuracy in the diagnosis of this disease.

BIBLIOGRAPHIC NOTICES.

Discovery of the Existence of continual vibratory Movements produced by Cilia, in Amphibia, Birds, and Mammiferous Animals. By PROFESSOR PURKINJE and Dr. VALENTIN, of Breslaw.

THE remarkable property possessed by some parts of certain animals, of producing constant currents in the surrounding medium, which in such cases is generally fluid, has justly attracted the attention of naturalists, and given rise to a series of observations. This phenomenon was first discovered in the *infusoria*, in one order of which, the *rotifera*, it is produced by a very perceptible wheel apparatus. Similar phenomena were subsequently observed in muscles, by Erman, Baer, Carus, and others. The singular rotation of the embryo in the ovum, which is easily distinguished in these mollusca, has been correctly attributed to the same cause. Many other *invertebrata*, also, and their ova, afforded similar instances. Steinbach was the first to discover any thing analogous in the *vertebrata*, namely in the gills of the *batrachia*, while in the *larva* state; although his description is not altogether correct. Later naturalists, such as Carus, Hugi, E. H. Weber, Stiebel, John Müller, and others, have made successive contributions to these interesting facts; but we must refer those who wish for information on the subject as far as it has been hitherto known, to the excellent article by Sharrey, in *Froriep's Notizen*, No. 618.

In the beginning of last spring, one of us, while examining with a microscope some rabbits that had been impregnated three days previously, in order, if possible, to find ova in the fallopian tubes, perceived small particles of the mucous membrane of the oviduct in rapid motion, and revolving round their axis. The other confirmed the correctness of the observation, and immediately recognized it to be an instance of the vibratory motion already alluded to. The whole of the uterus, and the internal genital organs in general, were then attentively ex-

amined, and it was ascertained that these movements existed in them throughout, although in different degrees of intensity in different places. They were lively through the whole extent of the tubes, less strong in the cornua of the uterus, still less so in the united portion of that organ, most lively and rapid in the dark red and swollen uterine lips, and strong enough in the vagina. It was natural for us to proceed next to examine the oviduct of a bird through which an ovum had just passed; and we found, as we had expected, the most lively and constant vibrations through its whole extent. We afterwards examined animals that were not impregnated, and in these, as well as in the amphibia which we subsequently procured, we found the confirmation of our singular and interesting discovery. This of course induced us to search for the phenomenon in other parts of the animal body also, and we thus arrived at results the most important of which we now proceed to state.

Parts and Classes of the Vertebrata in which the vibratory Motions occur.

As far as our observations have hitherto gone, there are but two systems of organs in which these vibratory motions occur, namely, the female organs of reproduction, and those of respiration; and that, on the whole of the internal surface of both, in all the *mammalia*, birds, and complete *amphibia*. There is not the least trace of them observable in any part of the intestinal tube in the *vertebrata*; and even in the *invertebrata* we know but of a single instance, which, moreover, cannot be considered as a perfect one. In the intestine of the river muscle there is a longitudinal fleshy elevation, which alone is possessed of this property, the rest of the mucous membrane being completely destitute of it; a circumstance which gives some reason to suppose that the part in question is connected with the sexual functions. We were equally unable to detect it in the male genital organs, gall bladder, gall ducts, excretory ducts of the glands, ureters, pelvis of the kidney, urinary bladder, arachnoid of the brain and spinal cord, inmost coat of the arteries and veins, surface of the globules of the blood, membrane of the ovum and investing membranes of the embryo, and in the cutis, &c.

In all the amphibia, such as snakes, lizards, and so forth, and also in birds and mammiferous animals, the whole of the mucous membrane of the oviduct, both in the impregnated and unimpregnated state, possesses the property of producing this vibratory motion; and every portion of it may be employed to

demonstrate the fact, when managed according to the method to be presently described.

The mucous membrane of the respiratory organs throughout their whole extent may be employed for the same purpose; indeed the vibratory motions may even serve as a sure test of the system to which the membrane belongs. Thus, in the *mammalia*, the whole of the mucous membrane of the air tubes and their branches, to the very finest ramifications that can be examined, exhibit these motions; while the glottis and its ligaments, and the mucous membrane of the mouth and pharynx present no traces whatever of them. On the other hand, they are so much the more perceptible in the nostrils, and cease in a very striking manner exactly where these terminate. But in the *amphibia*, as, for instance, in salamanders, in which the mouth is not merely an organ of deglutition, but also one of respiration, the mucous membrane of the pharynx exhibits remarkably lively vibrations.

Should it be hereafter completely ascertained that the mucous membrane of the genital and respiratory organs alone are possessed of this property, it would be an additional contribution in support of the analogy that has already been shown to obtain between them in so many respects.

It has been already stated that the property resides universally in *amphibia*, birds, and *mammalia*. On the other hand, we never could observe the least trace of it in fishes, notwithstanding all our endeavours in the research. We examined for this purpose the feelers of the *silurus glanis*, with the gills and mucous membrane; and the head, intestines, air-bladder, kidneys, and ureters, as well as the skin, of that and other fishes. In the embryos, also, of the perch and carp, in various early stages of their development, there was nothing of the kind to be found.

Method of Examination.

As the vibratory movements occur on the whole of the surface of the mucous membrane, the only question is how to examine the latter conveniently under a strong magnifying power. With such parts as have long cilia, as in the case of the commencement of the oviduct in birds, this may be effected by spreading a portion of the membrane on the object-holder, covering it with water, and applying a sufficiently strong power. In general, however, the following directions must be followed, to insure success.

The animal whose membranes are to be examined must have been just killed. A small piece of the requisite membrane

is then to be cut out with a fine pair of scissors,* and doubled on itself, in such a manner, that the under surface is to be inside, and in contact with itself, and the upper, outside ; the edge of the fold being thus formed by the latter. The preparation is next to be put, with some water, in the *microtomic compressor*,† and gently compressed, so that the edge of the fold shall be brought fairly under the microscope. Even this arrangement is sufficient to exhibit the phenomenon with great beauty ; but to make it still more striking, we should employ a fluid containing a number of fine particles. Water, in which has been macerated some of the black pigment of the eye, is best suited to the purpose ; but the less experienced observer must be on his guard against being deceived by the very lively molecular-movement of Brown possessed by the small particles of the pigment. Blood, also, when properly diluted, may be used for the same purpose. The current of the particles along the edge of the fold is then so strong as to strike the most unpractised eye.

It must be borne in mind, however, that it is absolutely necessary that the mucous membrane alone should be employed ; and that, consequently, not a particle of muscular coat, or bronchial cartilage, should be suffered to adhere to it, otherwise the experiment would be almost completely spoiled.

Nature and Manner of the Vibratory Movements.

These undulations or vibrations are motions on the surface of certain animal parts, of such uncommon rapidity, that when at their natural swiftness the eye can scarcely follow them. Whenever they occur they, as well as the current produced, proceed in one certain direction. The only exception to this rule we are acquainted with, occasionally occurred in the appendages of the gills of the river muscle, in which the motion took place alternately in opposite directions. The process

* In the original it is, "*einer feinen Davielschen Scheere*," indicating a particular kind, so called, I suppose, from the name of its inventor : what its nature and properties are, however, I have no means at present of ascertaining.—Tr.

† The microtomic compressor, in the original, *Der microtomische Quetscher*, is an instrument invented by Professor Purkinje, for the purpose of facilitating microscopic observations. It consists of an apparatus, by means of which two parallel glass plates can be gradually approximated, so as to compress an interposed soft translucent object, while under the microscope, to any required degree. A description of it, illustrated by figures, is to be found in the same number (V.) of Müller's *Archiv*, from which the present article was taken.—Tr.

was perfectly regular, the change of direction occurring exactly every six or seven seconds. In all other cases, be the degree of vitality what it may, the motion, and its resulting current, invariably maintain the one direction.

From what we have observed, it is highly probable that all these undulations are produced by cilia; since, as shall be shown on another occasion, we have discovered plain traces of them even in the larvæ of the *batrachia*. In the female genital organs, and those of respiration in mammalia, birds, and amphibia, there is no mistaking these cilia. They appear strongest in the oviduct of birds and serpents, weaker in that of mammalia, and still more delicate in the membrane of the mouth of the salamander. As long as the motion is very rapid, it can be distinguished only by a very practised eye; but as it becomes weaker it is easy to perceive the cilia rising and falling, till at last, on its total cessation, they project like a row of pallisadoes from the edge of the fold. It can be then clearly seen that they run up tapering from the base, and terminate in an extremely fine and delicate point. Their interior is clear, and presents no sign of globules. They are of an exceedingly tender consistence, and are in consequence very easily destroyed.

No exterior agent has any influence on these undulations as they occur in the three higher classes of vertebrata. The contraction of the subjacent muscular tissue, as for instance in the uterus of the mammalia, only interferes with the observation of the phenomenon, as we have already seen, so that it cannot be perceived distinctly until they are removed. Animal heat has just as little influence. The undulation has been observed to be as lively in parts which had long been quite cold, and had even lain in cold water, as in those that were still warm.

It is also sufficiently strong, in these classes, to propel, not only the small particles in the immediate neighbourhood of the vibrating surface, but likewise particles of the membrane itself. The latter, however, does not occur near so remarkably and to such an extent as we have observed it in muscles; and although in these mollusca the vibrations are by no means of much greater rapidity, strength, and intensity, than in the three classes of vertebrata above-mentioned, they are yet of much greater constancy; as we have seen them continue with undisturbed vivacity in half putrid, dissolved, and macerated muscles, while in the others they are immediately destroyed by the addition of a drop of an acid, or of an alkaline solution, to the surrounding fluid.

Their duration is of various degrees. In the oviduct of birds they continue for about half an hour after death, in that

of mammalia, about twenty minutes ; and in both classes about half as long again in the mucous membrane of the respiratory organs. We have even observed them extremely lively in the nostrils of a rabbit that had been killed two hours previously.

Although this vibration appears to be, as it were, an essential and universal morphological phenomenon, still it is not altogether without some secondary uses, obvious even to us. Thus, the fluids secreted in the membranes in which it occurs, may, by its means, be immediately propelled forwards ; and, perhaps, many singular phenomena may be accounted for in this manner. For instance, the bronchial mucus that has been collected during a long-continued sleep, is not afterwards hawked up from the bottom of the lungs, but from the larynx or trachea. However, we shall dwell no farther on this subject, to keep out of the extensive field of mere hypothesis.

It is to be observed, that we do not use the expression vibratory motions [*Flimmerbewegungen*] in the same sense in which it has of late been employed, as, for instance, when speaking of a certain phenomenon observed in the blood ; but to designate as distinct and regular a process as any in the whole range of natural history. It certainly sounds strangely enough, to talk of finding hairs or cilia in the bronchial mucous membrane, or in the interior of the body at all, and that to such an extent ; but we can fearlessly refer every one to his own observations, which are in this case readily made. At the same time we must remark, that in order to judge the matter fairly, it is necessary to employ a magnifying power of three or four hundred times in diameter. Whoever has such glasses, and attends to the above-mentioned precautions, will find it an easy matter to observe this wonderful and beautiful phenomenon.—*Translated by WILLIAM WEST, M.D. from Müller's Archiv, 1834, No. V.*

On the Anatomy and Diseases of the Neck of the Bladder and of the Urethra : being the Substance of the Lectures delivered in the Theatre of the Royal College of Surgeons in the Year 1830 ; and in the Westminster Hospital in 1833 and 1834. By G. J. GUTHRIE, F.R.S., Surgeon to the Westminster Hospital, and to the Royal Westminster Ophthalmic Hospital, &c. &c. &c. London, 1834.

THIS new work of Mr. Guthrie is a valuable addition to his already numerous contributions to the practice of surgery, and will, we venture to predict, tend materially to increase the re-

spect which the profession justly entertains for a person so long and so usefully devoted to the study of the means best calculated to afford relief in some of the most distressing diseases incident to the human frame. Of these, none are better calculated to excite commiseration than diseases of the bladder and its appendages, and none better suited to display the resources of our art. It is true, that the pathology of urinary diseases is comparatively not merely of modern but of recent origin, and consequently the treatment suited to each particular variety of these affections, is not always established on a firm basis. Still, however, much, very much has been accomplished by the labours of our own countrymen, and of our continental brethren, since the commencement of the present century, and every year contributes something new to the store of practical precepts already accumulated. Acquainted, as every professional man must be, with the learning, ability, and above all with the veracity of Mr. Guthrie, every record of facts and opinions coming from such a source will be perused with that peculiar pleasure, which is inspired by the feeling, that we are studying the registered and authentic directions of a guide at once erudite and practical. Under these circumstances, it is not our intention to act the part of critics on introducing Mr. Guthrie's work to the notice of our readers; commentaries on our part are happily quite unnecessary, and we shall therefore content ourselves by quoting, without abbreviation or note, one or two of those numerous passages which contain original and useful information, remarking, however, that we are discontented with only two circumstances connected with Mr. Guthrie's publication, viz., its price and its style. The former is excessive, and the latter, he will pardon the remark, very careless, and too much the fac simile of an extemporaneous effusion. With respect to some of the anatomical and practical details, our excellent author has probably been too anxious to bring them forward in such a way as to wear the appearance of novelty. We regret extremely, that in his third lecture upon what he terms new muscles of the membranous part of the urethra, he has not availed himself of the paper published by Mr. Houston, in the fifth volume of the *Dublin Hospital Reports*. After some preliminary observations on the formation of pouches in the bladder, our author makes the following judicious remarks:—

“In the preparation before you there are five pouches of different sizes; and there was one symptom in this case which I had met with in three others, without being able to account for it, and which may have depended on the same cause.

“The first instance occurred in the York Hospital, at Chelsea, in the year 1816. The patient, a soldier, had been invalided for some complaint of his urinary organs, of which a stricture formed one. The removal of this did not much alleviate his symptoms, and on examination with the catheter, a smart blow was felt on the instrument with the termination of the flow of urine, giving rise to the idea of a stone. This always took place, and sometimes the stroke seemed to be repeated twice, or even three times, although each time fainter than before. The first blow would sometimes force the catheter from between the finger and thumb when slightly held, and at least two inches out of the urethra. Many able surgeons saw this case, several thought there was a stone in the bladder, and some even advised an operation. It appeared to me and my colleague, the late Mr. Morel, that the blow was deficient in the sound which a solid, hard substance gives, the *tick* as it is often called technically. The substance causing it could never be detected by the most careful examination after the urine had been evacuated, nor while the bladder was full, but only at the moment of its becoming empty; and I was led to the conclusion, that if there was a stone it must be enclosed in a sac, and that it was the soft envelope which rendered the sensation communicated by it so obscure. The man was discharged.

“In the second and third cases the sensations were the same, save that the little taps on the catheter resembled more the blows given by the wings of a bird in fluttering, so that I have been in the habit of calling them the *fluttering blows of the bladder* in my Lectures, believing that they depended on some unusual action of the oval cavity of the fundus, or of the base of the triangular space acted upon irregularly by their own fibres, and by those passing perpendicularly and across by the sides of the neck of the bladder, and which have been considered as a sphincter. The last case I met with cleared up the difficulty. The blow was perfect, and resembling that from a stone in every respect save two, namely, the grate which a stone gives or ought to give to either a silver, a steel, or a gum elastic catheter, and the impossibility of finding it except when the last drops of urine were flowing. I examined the bladder several times very carefully, and even did it, allowing the urine to flow between the blades of the small calculus forceps, which were kept open to catch any thing which might pass between them. The silver catheter often received so smart a shock, that it was forced out a couple of inches, and from between the fingers when held loosely, so that the patient himself could not help observing it, and asking the cause. I was never satisfied during his life that there was not an encysted stone in the bladder, although I was quite sure there was not a loose one. The examination after death decided the point; there was not a stone of any kind, and nothing peculiar save the five pouches, and the bar at the neck of the bladder formed by its elastic, but now rigid substance, totally unconnected with the third or middle lobe of the prostate; and the peculiar fluttering strokes of the bladder on the catheter, were caused, therefore, I have now no doubt, by the descent of the pouches

containing urine, and by there being more or less solid substances, they fell against the instrument, or were brought forcibly against it, by the muscular efforts of the bladder in contracting on the evacuation of the last drops of urine from its cavity.

“ When symptoms have given rise to the suspicion of the existence of a stone, and the fluttering strokes or blows on the instrument have been felt, I suspect it may have happened that the operation has been performed, and no stone has been found. At all events, a surgeon may be forgiven for the mistake more readily in this case than in most others, and I therefore dwell upon it longer than it perhaps requires, in order to prevent such a misfortune from occurring in future. I cannot help thinking it has been the most common cause of such an accident; and when I hear and have heard, that although no stone was found, the patient, when he survived, was much the better for the operation, I am more satisfied that I am likely to be correct in my supposition. The good done by the operation was caused by the division of the bar at the neck of the bladder, and the consequent removal of the obstruction to the passage of the urine out of it; and I approve of a proper operation being done for this purpose in certain and peculiar cases to be hereafter noticed, but then the patient is not consenting to an operation, supposing it to be for the removal of a stone, and the surgeon is not relieving him by a mistake.—pp. 30-33.

In the following, which we reprint with the exception of one sentence, in the propriety of omitting which we are sure Mr. Guthrie will concur, we are not quite sure that our author can claim much praise for novelty,—the anatomical fact is, however, well given.

“ It is usually said, that the female has not a prostate, but merely an erectile tissue surrounding the neck of the bladder, to which I do not assent. If the word prostate be used with reference to its derivation, as standing before the *vesiculæ seminales*, certainly a woman has not a prostate, because she has no *vesiculæ seminales*, but if it be used as a substantive word, to express a particular thing, in the same manner as the words *arteria innominata* are now used as a name for a particular artery, which formerly had no name; then a female has a prostate, for there is a substance of the same shape, form, and nearly of a similar structure surrounding the commencement of her urethra. It is the size of the prostate in a boy before the age of puberty, and resembles very nearly in external appearance the same part in the male. Here are the prostate and bladder of a boy of twelve years of age, and these two other preparations in spirits show the bladder and prostate in the adult female. One bladder is opened from the fore-part, the other from the back part, to show how much of this substance lies before and behind the commencement of the urethra. You will observe, in these two recent dissections of the same parts, that the band, on which the ureters are situated, is less marked, as well as those descending from them, than in the male, but the elastic

structure is equally evident. The ejaculatory ducts of the male, opening into the urethra, are of course wanting, and there does not appear either to be any ducts of the prostate, so that, perhaps, this substance may be considered in the female to be partly destitute of the follicular or glandular structure, which gives the additional bulk to the male. The fibres of the bladder have the same arrangement in the female as in the male, and I am therefore induced to believe, that the prostate gland in the male has at least three offices, viz. 1, to stand before the orifice of the bladder, and give it and the urethra which it surrounds support, and a point, more or less fixed, upon which it may act in expelling urine; 2, to secrete a fluid peculiar to itself; and 3, to receive the ducts conveying secretions from other parts; which two latter uses I do not attribute to it in the female, and the want of which may account for the difference of size in this part in the two sexes. Cowper, who was well acquainted with it, calls it *corpus globosum*.

“De Graaf, in his Work *De Mulierum Organis*, page 323, has the following passage bearing on this subject. ‘Sed ulterius, inquirat aliquis, unde illi ductus sive lacunæ humorem illum hauriant? priores, illæ scilicet, quo circa colli orificium et meatus urinarii exitum conspiciuntur, ex *parastatis mulierum* seu potius crasso et membranoso corpore circumcirca meatum urinarium existente humorem suum accipiunt; posteriores verò ex nervoso-membranosâ colli uterini substantiâ liquorem suum colligant.’”—pp. 35-37.

Mr. Guthrie's remarks on hemorrhage from the urethra, are very judicious and deserving of attention.

“The most alarming hemorrhages I have met with have been from common causes; and I will mention to you two of them of the most prominent kind, as they also point out the practice to be pursued in such cases. The first occurred in a gentleman living in Cockspur-street, who had had a catheter passed by a surgeon of great reputation and ability in the morning, without either pain or inconvenience. On his return home he found there was a considerable oozing of blood, which continued during the day, and induced him to send in the evening for his surgeon, who was unluckily out of town; the bleeding increased in the night, and in the morning early I saw him. There were several tubs of ice and water in the room, all apparently containing a considerable quantity of blood; his face was deadly pale, the pulse scarcely perceptible; and he said he had bled a pailful, which was of course an exaggeration. The bleeding was arrested in a few minutes by pressure applied in the proper place (on the perineum), and did not return.

“The second occurred in the case of a tradesman, who had passed a common soft bougie for himself, the point of which had caught on some small opening, and it is presumed, had penetrated into it; he bled for two days and two nights, when I was desired to see him in Paddington-street. I found him kneeling in bed, and straining violently to pass his water, but which came with great difficulty, as the bladder contained a good deal of coagulated blood, which had passed

backwards into it. He was as white as a sheet, and fell back in his bed, nearly insensible, almost as soon as I entered the room, having, as he said afterwards, passed several quarts of what (as it all coagulated) he considered to be pure blood. As urine and blood coagulate together when out of the body in equal portions, it is probable that only one-half of it was blood. This bleeding was also arrested in a few minutes by pressure, and did not return.

“For the purpose of knowing where to make the pressure, any light, flat, and narrow, but firm substance should be prepared, such as a piece of cork, which can always be procured. The patient should then force all the coagulated blood out of the urethra; and as the bleeding usually takes place in these cases from that part which is anterior to the triangular ligament, pressure can readily be made upon it externally; but as it may be made a little before or behind the exact spot, in either of which cases it would be useless, the selection of that spot must be well made. This is done by beginning as far back as possible, and gradually bringing forward the finger by which the pressure is made. At a certain point the flow or dripping of blood will be arrested, and the precise spot from which it comes will be in all probability a little behind where the finger rests, a fact which can also be easily ascertained by carrying the finger a little backwards, when the blood will again flow. The bit of cork or pad can now be duly placed, and the patient should be desired to make pressure on it himself, and which he can often more readily do than an assistant.

“When the hemorrhage comes from the prostatic part of the urethra or neck of the bladder, cold water, rest, and an opiate will suffice to stop it, provided it has been caused by some accidental circumstance, and does not arise from disease of a fungous or malignant nature, in which cases nothing can prevent its return, or even its continuance.”—pp. 136-138.

Here however we find that we must reluctantly refrain from giving further extracts from Mr. Guthrie's work; indeed the state of our present number warns us to have done, for the great length of the original articles has incroached upon the space usually allotted to the reviews, so considerably, that we are forced to take leave of Mr. Guthrie, rather unceremoniously. His work we beg leave to recommend strongly to our readers.

The Principles of Physiology applied to the Preservation of Health, and to the Improvement of Physical and Mental Education. By ANDREW COMBE, M.D., Fellow of the Royal College of Physicians of Edinburgh. Third Edition, revised and enlarged. Edinburgh, 1835.

ALTHOUGH not phrenologists we have long been admirers of Doctor Combe, and have to thank him for much instructive

information. Our author is not indeed deeply versed in the higher departments of physiology, but he is quite master of the more intelligible, we had almost said, more useful, branches of that science; and he possesses a peculiar tact in collecting and collating facts in such a manner as to render them doubly fruitful and productive. In none of his works is this excellent quality more apparent than in the work before us, which we confidently recommend to our readers as highly instructive and entertaining. Notwithstanding the efforts made of late years by the Society for the Diffusion of Useful Knowledge, and notwithstanding the recent strides of intellect in its boasted march, still mankind are singularly ignorant of that, which of all things concerns them the most, viz., the structure and functions of their bodies. The practical physician every day meets with striking examples of the evil consequences which this ignorance produces, and every day he laments the bad effects arising from a want of knowledge concerning matters essential to the preservation of health. How often, for instance, does it occur to him to observe a person, whose mind is highly cultivated in almost every other department of science, entail on himself long-continued and dangerous diseases by some mismanagement of his body, of which he never would have been guilty had he been acquainted with the more obvious principles of physiology! On this subject, however, we must not anticipate the observations of Dr. Combe.

“Let it not be said that knowledge of this description is superfluous to the unprofessional reader; for society groans under the load of suffering inflicted by causes susceptible of removal, but left in operation in consequence of our unacquaintance with our own structure, and of the relations of the different parts of the system to each other, and to external objects. Every medical man must have felt and lamented the ignorance so generally prevalent in regard to the simplest functions of the animal system, and the consequent absence of judicious co-operation of friends in the care and cure of the sick. From unacquaintance with the commonest facts in physiology, or incapability of appreciating their importance, men of much good sense in every other respect, not only subject themselves unwittingly to the active causes of disease, but give their sanction to laws and practices destructive equally to life and to morality, and which, if they saw them in their true light, they would shrink from countenancing in the slightest degree.

“For proof of this I need only refer to the evidence on the Factories Regulation Bill, which lately occupied so much of public attention. The law then in operation authorized the working of children between the years of eight and sixteen, in the close-heated atmosphere of a cotton-mill, for twelve hours a-day; and as a great boon,

no children are now to be employed under nine years of age, while between that and fourteen the period of daily labour is not to exceed eight hours. Had our legislators been instructed in anatomy and physiology so far as to obtain even the most general notion of the constitution of the human body, and had they been aware of the intimate dependence of the mind on the condition of the bodily organization, they would at once have perceived the destructive tendency of the former system of labour and confinement, and the utter impossibility of combining with it that moral and intellectual cultivation which is so imperatively required. Instead of objecting to the limitation when it was proposed, they would have looked forward with dread to the physical and moral degradation which the system then in operation was fast effecting in the multitudes under its influence; and their only doubt would have been whether even *eight hours'* labour in a close atmosphere was not too much for undeveloped children. The evidence in the printed report to the House of Commons is said to have been partially got up; but granting that it was so, it nevertheless contains a multitude of facts so entirely in accordance with the soundest and best understood principles in physiology, and which no counter-evidence can rebut, that one can only lament the ignorance which prevented many able and benevolent but prejudiced men from perceiving its true character, and yielding at once to the imperious dictates of nature and of duty. That there were great difficulties in the way of every alteration is quite true; but surely no question of mere gain to any or to every class ought to be allowed to stand *for ever* in the way, when the lives and happiness of multitudes of our fellow-creatures, and the tranquillity and real prosperity of the country, are at stake. Unless we *begin* somewhere, how can any improvement ever be accomplished?

“Another instance of the dangers of ignorance lately presented itself. In the *Edinburgh Advertiser*, of 1st March, 1833, we are informed that ‘a distressing occurrence was discovered on Wednesday forenoon, on board the *Magnus Troil*, Shetland trader, Captain Ganson, lying at Leith. The master and mate, who are brothers, went as usual on Tuesday night to sleep in the cabin of the vessel, but not appearing at the customary hour in the morning, the crew thought they had merely slept beyond their time. A little time having elapsed, they were repeatedly called, but no answer being returned, one of the men went into the cabin, where *he found the two brothers almost dead through suffocation*. It is thought that they had shut the companion and sky-lights so close, that they had during the night *exhausted the whole of the vital air necessary for respiration*, contained in their confined situation. Medical aid was procured, and hopes are entertained of their recovery. Both were much respected.’ Captain Ganson, however, did not recover, but died convulsed on Thursday morning.

“Since the publication of the preceding statement, doubts have been entertained whether the catastrophe resulted simply from con-

fined air, or from the stove not having been extinguished, or from impure air proceeding from the bilge water. But as all agree that the accident could not have happened if there had been a proper supply of fresh air from without, it matters little from which of these sources the impure air was derived; for it is quite certain that had Captain Ganson and his brother possessed the slightest acquaintance with the nature of the atmosphere, and the relation of its elements to the function of respiration, they would have seen too clearly the danger of shutting themselves up in a confined space, ever to have risked their lives in the way they did. A constant supply of pure air is indispensable to the formation of proper blood in the lungs, and consequently to the preservation of life and the wellbeing of the whole body; but formerly, when this condition was as little known or regarded as it was by Captain Ganson, many persons were shut up together in small ill-ventilated rooms in schools, jails, and hospitals, and the natural result was a degree of mortality from fevers and other diseases, which, now that the laws of respiration are better known and more attended to, is never heard of.

“ From the same hurtful absence of knowledge, a law exists, or lately existed, in France, by which infants must be taken within a very short time after being born to the office of the *Maire*, if it is wished to have their births registered. But there is another and higher law, made by the Creator, with which this enactment is at variance; and that law renders the infant incapable of bearing exposure to a low temperature without injury. The result is, that in winter, especially in places where the *Maire* resides at a distance, and where, consequently, the exposure is increased, a greater mortality takes place than is observed among infants placed under more favourable circumstances. Had the nature of the living functions been generally understood by the framers of such a law, it is obvious that it could never have been enacted, for to have done so knowingly would have been in substance to legalize infanticide.”—pp. 20-24.

The following observations are so judicious that we cannot avoid the temptation of extracting them for the benefit of our readers.

“ It is this apparent but unreal separation of the effect from its cause, which has given rise to the variety of opinions entertained in regard to the qualities of the same agents, and which has, perhaps, tended more than any thing else to discourage rational regard to the means of preserving health; and yet this very variety is a proof at once of the absence of sound views of our own nature, and of the urgent necessity of possessing them. In society, accordingly, nothing is more common than to hear the most opposite opinions expressed in regard to the evils or advantages of particular kinds of clothing, food, and exercise. One person will affirm, with perfect sincerity, that flannel is pernicious, because it irritates the skin, and uniformly causes an eruption over the whole body; and that

linen or cotton is an excellent article of dress, because it produces no such consequences. Another will tell us, with equal truth, that flannel is a capital thing, because it is pleasant to the feeling, and affords protection from cold and rheumatism, which linen does not. One will affirm that a long walk or violent muscular exercise is an excellent tonic, because it gives a keen appetite, and a vivacity and alertness which are delightful. But another will declare that a long walk or severe exercise is exceedingly injurious and debilitating, because it destroys his appetite, and unfits him for exertion of mind or body, and always gives him headach. One will, in like manner, praise vegetables as the best diet, and another animal food as infinitely superior, and so on through the whole range of the physical objects which act upon the human frame; and the natural consequence of these apparent anomalies and contradictions is, that, when in health, we come practically to look upon the effects of air, food, exercise, and dress, as very much matters of chance, subject to no fixed rule, and therefore little worth attending to, except when carried to palpable extremes, or in the cure of disease; and, in this way, man, instead of being able to protect his children by the results of his own experience in his journey through life, goes on from generation to generation, groping a little, then seeing a little, and then groping again, till he arrives, often prematurely, at the end of his existence, when he stumbles into his grave, leaving his posterity to pass unaided through the same series of experiments, and arrive at the same termination, as himself.

“ This unnatural result must arise either from the laws which regulate the animal functions, and the operations of external objects being variable and ever changing, or from the conditions of the living body on which they act being different in different persons, or in the same person at different ages or seasons; and it is not difficult to determine to which of these it is to be ascribed. It cannot be the first, for the laws of nature are invariable and unbending. The food which to-day nourishes and sustains the body, and which to-morrow, when sickness is present, raises the pulse and excites the heart to febrile action, has not altered its qualities or changed its relation to the healthy body. It is the state of the body that has changed, and caused the apparent discrepancy of effect. In judging, therefore, of the propriety, advantages, or evils of exercise, food, and clothing, we must take into consideration not only the kind of exercise, the kind of food, and the kind of clothing, but also the age, health, and kind of constitution of the individual who uses them, and adapt each to the degree in which it is required; and then we may rest assured that many of our difficulties will vanish, and certainty and consistency come proportionally into view.

“ Were the intelligent classes of society better acquainted with the functions of the human body, and the laws by which they are regulated, many of these anomalies in practice would disappear; the sources of much suffering would be dried up; and the happiness of the community at large be essentially promoted. Medical men

would no longer be consulted so exclusively for the cure of disease, but would also be called upon to advise regarding the best means of strengthening the constitution, from an early period, against any accidental or hereditary susceptibility which might be ascertained to exist. More attention would be paid to the *preservation* of health than is at present practicable, and the medical man would then be able to advise, with increased effect, because he would be proportionally well understood, and his counsel, in so far at least as it was based on accurate observation and a right application of principles, would be perceived to be, not a mere human opinion, but in reality an exposition of the will and intentions of a beneficent Creator, and would therefore be felt as carrying with it an authority to which, as the mere dictum of a fallible fellow creature, it can never be considered as entitled.

“ It is true that as yet medicine has been turned to little account in the way of directly promoting the physical and mental welfare of man. But the day is perhaps not far distant, when, in consequence of the improvements both in professional and in general education, now in progress, a degree of interest will become attached to this application of its doctrines, far surpassing what those who have not reflected on the subject will be able to imagine as justly belonging to it, but by no means exceeding that which it truly deserves.”—pp. 31-34.

As might be expected, from the previous works and studies of our accomplished and talented author, his eighth chapter on the nervous system and mental faculties is extremely interesting. He has treated this part of his subject in so able a manner, that we went on marking as we read, until, on a review of the whole chapter we found that our marks on the margin were every where continuous. No solitary passage had indeed escaped that acknowledged symbol of eulogy, the editorial brackets. We had, therefore, to commence our task again, and set about the more painful, but shorter duty of marking, not for the purpose of insertion, but of omission. In performing this duty we were more assiduous than successful; for many a passage which we had resolved to expel from our extracts, has, on a second, and more solemn trial, had its sentence of banishment commuted (shall *we* announce the truth?) for one of perpetual, though not solitary, imprisonment in our pages. The final result of all our deliberations was, a determination to venture on the commission of a great literary crime, the forcible abduction of the whole eighth chapter. Willingly would we have incurred, for the gratification of our readers, the extreme penalties of the law, but, although we had come prepared to commit the theft, we found that we were deficient in the means of carrying off the spoil, and therefore we have acted on the maxim, that honesty is the best policy. In sober

earnest, we take leave of Doctor Combe with regret, and are extremely sorry that the same reasons which made us terminate the review of Mr. Guthrie's work so abruptly, forbid us to indulge in further extracts from *Physiology applied to Health and Education.*

Outlines of Comparative Anatomy. By ROBERT E. GRANT,
F. R. S. Ed., F. L. S., Z. S., W. S., &c.

PART FIRST.

THE appearance of this work will be hailed with pleasure by all who are anxious for the spread of philosophical anatomy; and the perusal of it will give rise to speculations respecting the backward state of this department of medical education in these countries.

What, it will be asked, can be the reason, that so delightful a branch of science; one by far the most fascinating of any which the medical student is called to engage in, should be that of which, generally speaking, he remains in greatest ignorance? How does it happen that this, the grand key to that science which medical gentlemen claim as their own, physiology, should not be acquired before entering on the pursuit of so favourite and fashionable a species of knowledge?

That the study of comparative anatomy possesses a charm, beyond that of any other branch of medical education, will be admitted by every one the least versed in its nature and object: but by him alone who has entered fully into the consideration of it, who has traced, through different tribes of apparently dissimilar beings, the curious and apt modifications of the same organs and parts as applied to different circumstances, and modes of existence; by him alone can the full enjoyment of such contemplations be felt and appreciated. The extent, the variety, and the universality of the objects embraced in the study of comparative anatomy, leave no chance of want of occupation or of satiety to the individual who once engages in such an occupation. The student of bare, dry, human anatomy derives no such pleasures from his studies; for what interest can there be in tracing such objects as the surfaces, edges, processes, foramina, grooves, &c., of the bones constituting, for example, the human hand, compared with that attending an inquiry into the singular modifications of the same member, as exhibited throughout the different grades of animated beings, in adaptation to their respective modes of existence. No parallel, whatever, exists between the interest of the study in the one case, and in the other; it might be stated

as a mode of comparing the two pursuits, that a single object occupies the thoughts of the anatomist who confines his researches to the human body alone, whilst those engaging the mind of the comparative anatomist have no limit either as to number, variety, or interest. The student, therefore, is cheated of much of the enjoyment which the study of his profession is capable of affording, who is not led into such a train of investigations.

Respecting the importance of comparative anatomy, to the proper study of physiology, it would be a work of supererogation to dwell upon it. An examination of the structure of the human body, without an inquiry into that of other animals, would never have led to the brilliant discoveries in physiology which ornament the names of so many modern cultivators of the science. The notions of the older writers on the subject were speculative and absurd; and it was only as physiologists began to examine into the structure and mode of action of the organs in the lower animals, that the science assumed, in their hands, a rational and demonstrative form. In short, all the leading ascertained facts respecting life and organization, and respecting digestion, respiration, generation, &c. have been drawn from researches into these functions in inferior beings; and, consequently, the term physiologist is, at the present day, a misnomer as applied to any one who owns to a want of acquaintance with such sources of our knowledge; for, in fact, the terms comparative anatomy and physiology may be considered as nearly synonymous.

And all this being confessedly so, the question again presses itself, why do not the students of our land cultivate a branch of their profession, at once the source of so much pleasurable occupation, and which would raise their characters as men of science, elevate them in the eyes of the world, and in their own, above the mere bone-setter or druggist, and give them clear and rational views of the structure and functions of the human body, the derangements of which it is their province to rectify? The answer will not tend to the crimination of the student; apathy or aversion to the study of such topics, certainly is not chargeable to him; for, in Dublin at least, wherever the instructions delivered by the professors are illustrated by references to comparative anatomy, the effect is such as might be expected; that the greatest attention is paid to this part of the subject, and that the professor will be surrounded, after his lecture is concluded, by numbers of his class soliciting further information on such interesting topics. The distinguished professor of anatomy and physiology in Trinity College, who takes every opportunity to explain the mechanism of the human frame by illustrations drawn from comparative anatomy; the learned professors of

anatomy and physiology in the Royal College of Surgeons, and many of the private lecturers in this city, will bear testimony to the desire for scientific knowledge evinced by the students attending their respective classes, and will no doubt concur in opinion, that if encouraged and assisted, they would all become more or less skilled in this department of their profession. The fault lies in another quarter; it will be found in the codes laid down by the institutions which legislate for medical education, and in the practice of the different courts of examiners connected with these institutions; perhaps, indeed, it has origin more in the latter than the former, for whilst credit may be allowed to public bodies for an anxiety to avoid taxing the student with an additional expense, by not rendering attendance on separate courses of comparative anatomy imperative, (after all a false economy); the same indulgence cannot be extended to examiners who sedulously avoid all allusion to the subject in their inquiries into the qualifications of candidates for professional distinction and emolument. It is not so much necessary, for the diffusion of a taste in this branch, that there should be distinct lecturers on the subject, as that the general teachers of anatomy should inculcate the principles, and show the interesting applications of it to the elucidation of human anatomy; for it is chiefly with this view that the science is valuable to the medical man, and in this way would the student best relish its introduction. And there will be little venture in asserting, that it but requires a few occasional questions on the subject from authorized examiners, to set every teacher in the empire about the useful practice of instructing his classes accordingly, and render all students equally anxious for information regarding it, as they are for that on human anatomy. The influence of courts of examiners over medical education is omnipotent; lecturers frame the instruction which they deliver to their classes in accordance with the tendency and style of the final ordeal to which candidates for degrees or diplomas are obliged to submit themselves, and students, who generally take on themselves as little trouble as possible, prepare on the requisite *points*, and no more.

Were the subject-matter of these examinations more varied, a corresponding improvement in the quality of the professional information exhibited by students would rapidly manifest itself, as a consequence. In this quarter, therefore, will be found the cause why the delightful, ornamental, and useful sciences of comparative anatomy and physiology do not go more hand in hand together, and are not more spread and cultivated among the members of the medical profession; and in this direction

should the eyes of all be turned, who are desirous of reformation and improvement.

But what, it may be asked, has this diversion to do with the work before us? The application is obvious. The appearance of the "Outlines of Comparative Anatomy," in the hands of students, will have a tendency to lead them into the study of the subject, and it would impart a zest and encouragement to their study, to receive credit for it in their final examinations. Had the system here recommended been long since introduced into practice, Professor Grant would not have had the merit of being amongst the first in these countries to compose a manual of comparative anatomy; our libraries would, ere this, have teemed with such productions, as they do with similar writings on the anatomy of the human body, and both students and practitioners would have been making them the subject of frequent references.

But, to the work in question. It is announced on the cover, that "*these outlines will appear in four parts, the succeeding parts to appear at regular intervals, so as to complete the work by the 1st of October next. The four parts will form one thick octavo volume, illustrated with one hundred and sixty wood-cuts.*" And, should the forthcoming parts equal that which has appeared, there can be no risk in predicting, that the work will contain the greatest quantity of information in the least compass, and in the most pleasing form, of any on the same subject yet published.

The present number treats of *the organs of support or osseous system; the organs of attachment, or ligaments; and part of the muscular system, or active organs of motion.*

The following extract from the general observations on the osseous system will interest the reader, and of the subsequent details on the same section enough shall be here introduced, to convey some interesting information, and to show the general object and style of the work.

"As animals are organized to select and obtain foreign matter for their subsistence, and to convey it into their digestive organs, to be transported with them from place to place, they generally require some solid means of support for the attachment of their active organs of motion. These denser parts of the body serve as a solid framework to give form and solidity to the whole fabric, and to protect the more delicate organs. They consist for the most part of earthy materials separated from the food by the vital processes of the animal, and may be placed on the exterior or in the interior of the soft parts. These inert materials, or passive organs of locomotion, receive their forms from those of the soft parts, and are liable to change with the varying conditions of the contiguous living parts. When placed on

the exterior of the body, they may, without being organized, keep pace with the progress of growth in the living parts, by being periodically cast off and renewed; or they may increase by the addition of more extended layers to their surface; or their dimensions may be continually influenced by the contact of the parts which form them. But when this solid frame-work is internal, and is everywhere surrounded by the soft parts, giving attachment to muscles, or enveloping and protecting delicate organs, it cannot be conveniently removed from the system in a mass, nor preserve its proportions by the mechanical addition of layers to its surface, and is generally organized or permeated in every point by the soft parts which absorb the decayed materials and renew them particle by particle. The earthy materials thus formed by animals for the support of their soft parts are various, and their particles are generally united together by means of a condensed albuminous or gelatinous matter, which gives firmness and tenacity to the mass. Silica is found in the lowest forms of radiated animals; carbonate of lime in the molluscos classes; carbonate and phosphate of lime in the articulated animals, and phosphate of lime in the organized skeletons of the vertebrata. These earths, in consolidating, assume forms by the influence of laws which are in accordance with their ordinary physical properties; this we observe most obviously in the lowest animals, and least in the highest classes, where the crystalline arrangement of the particles is most equivocal; but under every condition they alike form a normal part of the structure, a solid frame-work more or less complete, constant in its form and structure in the same species, and varying in its form with the specific differences of animals. This solid frame-work forms the osseous system of animals, or the *skeleton*, as it has been termed from the dry and earthy nature of the materials which compose it. The osseous system, though not the most important nor the most universal system of animal organization, is met with under some form in every class of the animal kingdom, though not in all the animals of each class.”—pp. 1, 2.

The author then proceeds to treat of the organs of support in the *radiated or cyclo-neurose classes*, of which he adopts the following sub-divisions, 1. *Polygastrica*. 2. *Poriphera*. 3. *Polypiphera*. 4. *Acalepha*. 5. *Echinodermata*. Of each of these he describes the varieties in the form and structure of the skeleton—if the cellular, elastic, spiculated, and often earthy material which gives support to the other organic elements may be so called; shows the mode by which such skeleton contributes to the various kinds and degrees of locomotion, nutrition, respiration, &c.; traces the gradations from the more simple to the more complicated beings, by pointing out the addition of new organs in some, or the greater degree of perfection of existing organs in others; and judiciously illustrates each section by accurate and well executed wood-cuts.

"I. *Polygastrica*.—Many of the minute and soft polygastric animalcules possess an exterior firm, elastic covering, which protects the more delicate internal parts. This covering sometimes consists only of a more condensed form of the common integument, enveloping every part of the body, in others it forms a distinct thin pellucid sheath, into which the animal can withdraw its soft parts for protection. The exterior surface, even of the softest and most naked animalcules, supports the organs of motion—the minute vibratile cilia by which they are carried to and fro, and consists apparently of a thin film of the general cellular tissue of their body, rendered more firm in its texture by the continued action of the surrounding element. This condensation of the exterior integument is the origin of most of the skeletons of invertebrated animals, which have generally the organs of support thrown over the surface of their body to afford them at the same time protection. We have an example of one of these loricated animalcules in the *volvox globator*, (Fig. 1. A) so common in stagnant pools of fresh water, and which often owe their green colour to the abundance of this animalcule."—"But the most distinct form of the skeleton met with in this class, is that which envelopes the body as a sheath, into which the animalcule can withdraw its soft parts when alarmed, and from which it can extend its ciliated anterior portion for the purposes of nourishment, respiration, or progressive motion. This vaginiform, exterior, thin, pellucid, elastic covering is seen in the *vaginicola innata*, common in sea water. This animalcule, formed like a *vorticella*, is seen in Fig. 1. E, extending its ciliated anterior margin from the opening in its sheath, and swimming by the action of its cilia."—pp. 3, 4.

"II. *Poriphera*.—The skeleton of poripherous animals consists of separate minute, earthy, crystalline spicula, connected together by a condensed, elastic, cellular substance; or of tubular elastic filaments of a horny consistence. These hard parts are developed internally throughout the whole cellular tissue of the body, and are often protruded externally through the surface, to protect the pores, or the large vents."—"The forms of these hard parts are different in every distinct species of these animals, and they are constant in the same, so that they present useful characters for the distinction of species in this polymorphous class. They are formed from materials due to the vital energies of the animal, and they form normal and necessary parts of its structure, like the solid skeletons of higher animals. In Fig. 2 is represented at A the *haliclona oculata*; one of these soft animals, with a silicious skeleton. It is represented as alive, suspended from a rock by its spreading branched base of attachment (c,) the currents of water are seen at (a) rushing in through the pores, and issuing from the internal canals by the large orifices or vents at (b). The pores, canals, and orifices are seen exposed in the longitudinal section of the same poripherous animal at B. Fibres composed of bundles of spicula generally extend in a longitudinal direction in these animals from the base of attachment to the remotest points of

the surface. Smaller transverse fibres of the same composition connect those which are disposed longitudinally, and form the framework of the internal canals."—p. 5.

"In the horny species of poriphera the skeleton consists of thin elastic tubular translucent filaments united together and distributed around the pores, canals, and vents. These horny, tough, flexible threads have a close analogy in their mode of distribution through the whole interior of the body to the tough connecting matter of the spicula in the earthy species, and they give form and support to the whole fabric. Sometimes the internal canal which extends through these tubular horny filaments is filled with an opaque matter, which gives a great friability to the threads; but most frequently they contain only a transparent colourless fluid, as we see in the fibres of the common officinal sponge, which is a poripherous animal belonging to this horny group. The skeleton of all the poripherous animals is so soft and flexible in the living state, that none of the lengthened forms appear to be capable of growing in an upright position from their base of attachment. They hang down from the under surface of submarine bodies, as represented in these figures. A specimen of the common officinal sponge with a horny fibrous skeleton, is represented in fig. 4 at 2, as alive and cut from its point of attachment, c. The circular minute pores by which the streams of water enter the internal tortuous canals are seen all over the surface, as at *a a*, and the larger vents by which the currents issue from the body are seen on the most prominent parts, as at *bb*. The manner in which the horny filaments are united to each other throughout the whole mass of the body is seen at fig. 4, 1, where the broken ends of the fibres show their tubular character, and this is still more magnified at fig. 4. The meshes formed by these horny fibres, though apparently without order or regularity when the soft parts are removed, have the closest relation to the pores and the tortuous canals which wind through every part of the body. Now we see in these simple skeletons of poripherous animals, as in many vegetables still more remote from human organization, that nature begins the formation of an internal frame-work for the support and protection of the soft parts, by the deposition of detached earthy spicula throughout the cellular substance of the body, as we see in the human embryo the deposition of minute spicula of phosphate of lime in various parts of the soft gelatinous bones begins the consolidation of the skeleton. The abundance of silicious needles in the skeletons of the lowest poriphera assists in their conversion into flint, when their remains have been exposed for ages in chalk or other strata traversed by silicifying percolations."—p. 8.

"III. *Polypiphera*.—The animals of this class obtaining their food by polypi, or highly organized sacs developed from the fleshy substance of the body, we generally find the skeletons, whether external or internal, to present cavities or cells for the reception and protection of these delicate organs; and the various forms of these cells constitute a principal distinction among the skeletons of this

class. The simplest forms of the skeleton are presented by the horny zoophytes, or keratophytes, where it sometimes consists of tough, soft, flexible filaments which surround the cells of the polypi throughout the whole mass of the body, as in the *alcyonium* and *lobularia*. These form a transition from the horny species of poriphera to the more distinct forms of keratophytes. In the horny species of zoophytes the skeleton sometimes forms a tubular external sheath enveloping the fleshy substance throughout all the ramifications of the body, as in all the *sertulariæ*, *plumulariæ*, *antennulariæ*, and many other soft, flexible, and ramified forms.”—“In the *gorgonia*, and some other cortical zoophytes, there is an exterior fleshy substance in the living state which covers all parts of the horny skeleton. This fleshy exterior crust is indeed the animal, which forms by the deposition of successive layers the whole of the flexible branched, horny, and solid internal skeleton. If we make a transverse section of a thick portion of the *gorgonia*, or *antipathes*, we can easily perceive the concentric layers of which it is composed; and by peeling off the cortical fleshy mass from the exterior, and placing this living flesh in the sea, we find it to secrete a new internal horny axis for itself. The polypi, which are always and necessarily continuations of the fleshy substance of zoophytes, are developed from this thick fleshy crust in the cortical kinds, and hence we do not see any appearance of cells on the central horny axis in these animals, after the flesh has been removed.”—pp. 8-10.

“The carbonate of lime is the common consolidating earth of zoophytes, as silica is that of poriphera; and these are two of the most abundant materials of the mineral kingdom. By the abundance of these calcareous lithophytes on the shallow shores of the tropical seas, they prepare a rich soil for new islands and continents to be raised by volcanic action from the deep, while they at the same time tend to purify the mass of the ocean for the maintenance of higher animals by thus precipitating, in an insoluble state, the corrosive materials conveyed incessantly into its bed by rivers that wash the surface of continents. The deep purple colours of the *corrallium*, the *tubipora*, the *corallina*, and many others, the azure blue of the *pocillopora*, the bright yellow of the *melitæa*, and all the other lively colours seen in these calcareous skeletons are removed by the action of heat, and do not appear to depend on any peculiar mineral ingredient; and we observe the same animal nature of the colouring matter in the shells of articulata and mollusca, and in the coloured bones of many vertebrated animals.

“These skeletons of zoophytes are not exudations from the surface of polypi; the cell always precedes the existence of the polypus which is developed within it. They are developed from the gelatinous substance of the reproductive gemmules before any polypi begin to be formed, and they continue to be developed and extended by the fleshy mass of the zoophyte whether polypi are developed in the cells or not. There is but one life, and one plan of development in the

whole mass; and these depend not on the polypi, which are but secondary, and often deciduous parts, but on the general fleshy substance of the body."—pp. 14-15.

"IV. *Acalepha*.—Although there are no solid skeletons in any of the soft, gelatinous, free, and floating animals of this class, we generally perceive some firmer cartilaginous portions of the body which afford support to the organs of progressive motion or of prehension. There are crescentic cartilaginous laminae around the inferior central part of the body in the medusæ, which give support to the contracting fleshy overhanging mantle, and to the absorbent tubes prolonged from that part. There are firm superficial longitudinal bands in most of the ciliograde acalepha for the support of those minute vibratile fins by the motions of which they are carried through the sea. From the feebleness of their muscular system, and from their swimming habits, it is obvious that the acalepha can only support the lightest forms of the skeleton.

"In the *velella limbosa*, which floats on the surface of the sea there is a thin flexible perpendicular crest, which is covered with a thin layer of the deep blue-coloured mantle, and which rests obliquely on a horizontal stronger transparent flexible plate. The thin perpendicular crest, which rises above the water and serves as a sail, appears to be composed of the same condensed glutinous or horny substance which composes the skeletons of the keratophytes. The horizontal plate is thicker, concave below, marked with concentric lines of growth, and gives support to the deep blue mantle above, to the delicate marginal tentacula, (seen at *b b*, in both views of the velella,) to the numerous tubular suckers, and to the stomach placed beneath this concave horizontal plate."—p. 15.

"V. *Echinoderma*.—The skeletons of the animals of this class are generally in the form of external crusts or shells, covered with projecting spines."—"They consist of numerous detached or separate pieces, which protect the interior viscera, give attachment to the organs of motion, and generally give form to the whole body. The solid pieces which compose the skeleton are for the most part in form of calcareous plates, symmetrical in their shape and in their arrangement, and which present considerable uniformity of plan in their disposition throughout the diversified forms of this class."—p. 16.

"The exterior surface of the shell is covered, in the echinida, with solid calcareous spines, which rest and move upon the round tubercles. These spines are very large in the *cidaris*, where the shell is small; and they are small in the *echinus* and *spatangus*, where the shell is large. They grow, like the other parts of the shell, by successive deposition from the enveloping fleshy substance."—p. 20.

The DIPLO-NEUROSE, or Articulated Classes, are next described, and in the order here adopted.

"The animals of this great division have the trunk of the body

for the most part long and cylindrical, divided transversely into segments, and provided with numerous pairs of organs of motion symmetrically disposed along the sides. From their activity, their skeleton is generally in form of a light, thin, exterior, enveloping, condensed integument, to the inner surface of which the muscles are attached through the medium of the cutis, and which is periodically cast and renewed, to allow of the growth and increase of the inclosed soft parts."—p. 22.

"VI. *Entozoa*.—The exterior covering of intestinal worms is soft and elastic, to allow them with more ease and safety to move through the tough and constantly moving parts of the living animals in which they reside. The long cylindrical bodies of these parasitic worms would be impeded in their motions by any hard, inflexible shelly covering, which likewise could not be cast off and renewed in such a medium; hence their smooth, glistening, and unctuous covering has only that degree of density and toughness, which is adapted to protect them from tearing and compression during the movements of the living parts around them. This transparent elastic tunic is especially thick and firm in the long cylindrical, filiform, or trematoid entozoa, as the *filaria*, the *strongylus*, the *echinorhynchus*, and the *ascaris*."—p. 23.

"The exterior covering is more dense in its texture, and consequently more articulated in its appearance in those parasitic worms, which are found attached to the exterior surface of the gills, the lips, the eyes, and other soft parts of fishes, and which have thence been called *epizoa*. We already find in many of these animals, as in the *lernææ* and *chondrocanthi*, not only the head forming a distinct segment of the body, and the trunk partially divided by transverse depressions, but numerous appendices already developed from the sides of these segments, and some of these appendices, especially on the head, provided with moveable articulation."—pp. 24, 25.

"VII. *Rotifera*.—The wheel animalcules are more closely allied to the helminthoid articulata than to any of the inferior radiated classes, especially in their supra and infra-oesophageal ganglia, their abdominal longitudinal nerves, their dorsal vessel for circulation, their lateral maxillæ, their highly developed genital system, and their muscular activity. Their exterior covering, though generally thin and transparent as crystal, appears to possess considerable firmness from the numerous powerful muscles inserted into it, and from the transverse corrugations it presents when the body is drawn backwards to their fixed caudal extremity. Sometimes it is in form of a sheath enveloping the middle of the body, and open both before and behind, to allow the head and tail to be retracted and protected. This firm, tough, elastic covering of the rotifera has some resemblance in its hermogenous texture to that of the entozoa, and probably is persistent and enlarges with the body. There are no earthy

deposits formed in any part of the body of these minute and active animals."—p. 26.

" Their most solid parts relate solely to digestion, and the lightness of their exterior covering corresponds with the constant and rapid movements of these rotifera through their watery element."—p. 28.

" VIII. *Cirrhopoda*.—The cirrhopods, like the entomostracous crustacea, are articulated animals enclosed in shells like those of mollusca, so that they present both forms of the skeleton. They have six pairs of curled jointed members extending from each side of the body, from which this class has received its name."—" They are almost always inclosed in multivalve shells secreted from the outer surface of a fleshy, thin, enveloping mantle, and which are attached to submarine bodies either directly by their base, or by means of a fleshy tubular peduncle. These exterior shells are generally thin, laminated, dense, composed of carbonate of lime with animal matter, and grow by the successive addition of layers to their inner surface. The testaceous coverings are most developed in the *balani*, where the articulated members of the contained animal are least, and these exterior shells are least in the *anatifæ*, and other pedunculated genera where the feet are largest."—pp. 28, 29.

The details given of these singular animals, illustrated by a wood-cut of the *lepas anatifera*, convey satisfactory information respecting them.

" IX. *Annelida*.—The red-blooded worms lead us a stage higher in the development of the articulated skeleton, and especially in the organs of locomotion. Some, as the *pleione* and the *halithea*, have the exterior covering of the body still so soft and membranous, as scarcely to present an articulated appearance. Some, as the *leech*, have only the trunk of the body developed, and from the want of lateral setæ and cirrhi for progressive motion, have the segments surrounding the body very short and numerous, and thereby possess great flexibility of the trunk. In the earth-worm, the segments of the trunk are larger and firmer, and each ring is provided with eight very small curved, conical, hollow, sharp-pointed spines or setæ, which are disposed on the sides of the segments in two upper and two lower pairs. These setæ are surrounded each with a muscular sheath for their advancement and retraction, and they serve as organs of locomotion. In some annelides the setæ are hooked at their points, in others they are compressed, or spatulate, and in others subulate. In the simplest forms of annelides we sometimes find, as in the *nais*, but one long filament or seta developed from each side of each segment, which however still materially assists them in moving over a solid surface, or through narrow passages, or in their serpentine motions through the water. The softness of the skin in most of the annelides compensates for the want of articulated

feet, by allowing greater flexibility to the trunk, and the delicate sensibility of the whole skin compensates for the imperfect development of their organs of sense. This delicate and unprotected condition of their outer surface requires many of them to shield their whole body in external solid adventitious tubes, often most artfully constructed, and some, as the *serpulæ*, exude a calcareous conical tube from the surface of their skin, which enlarges like the conical shell of a gasteropod, by the successive addition of new and wider cones to its interior surface. But the true skeleton of these articulated worms, as in the higher entomoid classes, is their exterior skin and epidermic covering, to which the muscles of locomotion are attached, whether this part be hard or soft."—pp. 31, 32.

Speaking of the sea-centipede, the *nereis nuncia*, it is remarked, that "we already find in this worm the head distinct from the trunk, and consisting of several separate and moveable segments," and "that there is an enlarged anterior part of the trunk corresponding with the thorax of insects, the segments being nearly equally developed from this point to the posterior end of the trunk," thereby exhibiting a rise in the scale of complexity in the body, and an approach towards a division into head, thorax, and abdomen.

"X. *Myriapoda*.—In the myriapods the skeleton is more dense, the articulations are more distinct, and the jointed tubular appendices, for progressive motion, are more developed from the sides of the segments than in the helminthoid classes. Their muscles having firmer points of attachment, act with more energy and effect, and their movements effected in the thinner medium of the air are more lively than those of the helminthoid animals, which mostly inhabit a more dense aquatic medium. The segments of the body are here more numerous than in the higher articulated classes, and they are still, as in the annelides, nearly equally developed throughout the whole trunk. In some, as the *iuli*, the segments are calcareous, hard, and cylindrical, and the lateral appendices or feet are short, and for the most part double on each side of each segment. In other myriapods, as the *scolopendra*, represented in Fig. 15, the segments are depressed, coriaceous, composed simply of an upper and a lower arched plate, attached by a softer flexible portion of the skin upon the two sides, and generally each segment presents but one pair of extremities more lengthened than in the *iuli*. The first pair of feet are here in form of simple curved perforated hooks placed at the sides of the mouth, and the succeeding feet along the whole sides of the trunk terminate in a single sharp conical claw, less curved, with a very minute opposable spine extending from the interior of each terminal joint."—pp. 33, 34.

"These animals do not undergo metamorphoses like insects, nor acquire wings, but the number of their segments varies with their period of growth."—p. 34.

“ XI. *Insecta*.—The skeleton of insects, from its superficial position, and from the lightness and density of its materials, is well adapted for invertebrated animals destined for an aerial life. It is composed, in its densest parts, of a thin epidermic layer, a colouring matter often presenting the most lively hues, and a brilliant metallic lustre, and a thicker internal layer much resembling the woody fibres of plants, but composed of peculiar animal substances, termed *chitine* and *coccine*, and consolidated by small proportions of the phosphates of lime, magnesia, and iron.”—pp. 34, 35. “ There are generally thirteen segments distinguishable in the trunk of insects, of which the anterior forms the *head*, the next three the *thorax*, and the posterior nine the *abdomen*.”—p. 35. “ The head supports the organs of mastication and of the senses, and contains internally the parts of the mouth, the pharynx, the commencement of the oesophagus, and the two first pairs of ganglia.”—p. 36.

“ The thorax supports the legs and the wings, and is composed of three segments, the anterior of which is termed *prothorax*, the second *mesothorax*, and the third *metathorax*. The prothorax supports the first pair of legs, the mesothorax the second pair of legs, and the first pair of wings, and the metathorax has attached to it the third pair of legs, and the second pair of wings.”—p. 36.

“ The segments of the abdomen, commonly divided into an upper and a lower piece connected together at the sides by an unconsolidated portion of the integument, encompass the digestive and the generative organs, which, for the most part, terminate in the last segment. Each of the abdominal and thoracic segments is perforated on each side by a small spiracle or *stigma*, which leads into the respiratory tracheæ, ramified through every part of the body.”—p. 37.

“ XII. *Arachnida*.—In those air-breathing entomoid animals, without metamorphosis, without wings, without antennæ, and with generally more than three pairs of legs, which compose the class of *arachnida*, we observe a more concentrated form of the segments, and a more consolidated condition of the skeleton on the anterior portion of the trunk than in the lower articulated classes. The segments of the head are anchylosed to those of the thorax, so as to form a single division, the *cephalo-thorax*, which supports the organs of the senses, those of mastication, and those of locomotion. The posterior division of the trunk is the abdomen. In place of the long-jointed antennæ on the anterior part of the head, which we see in other entomoid classes, there are generally a pair of lateral pincers, or cheli, or a pair of flat and sharp-pointed piercing instruments at the sides of the head, more suited to their retired, cunning, watchful, and carnivorous habits.”—“ Although these animals retain the form with which they escaped from the ovum, they throw off periodically their exterior covering, like the larvæ of insects; and like the crustacea, they reproduce entire legs when they

have been removed from the body. The last abdominal segment of the scorpion is in the form of a sting, or ossified tubular poison-duct, as we frequently see that segment in insects.”—pp. 38, 39.

“ XIII. *Crustacea*.—The crustaceous animals possess the most solid form of the skeleton met with in the articulated classes. It is found in the larger decapods to contain nearly half its weight of carbonate of lime, and there is also a considerable proportion of phosphate of lime, with traces of magnesia, iron, and soda.”—“ The head and thorax are here commonly united, to form, as in arachnida, a cephalothorax, which is covered above by a large, continuous, arched plate, or carapace, and supports the usual appendices for mastication, sensation, and locomotion.”—“ The segments of the post-abdomen (*m*, *n*) are moveable, and sometimes extend backwards in a line with the cephalo-thorax, or are short, and fold in beneath that part.”—“ The chief differences in the skeletons of this class arise from the size, and the forms assumed by the convertible lateral appendices of the segments, and the extent to which the segments are developed or anchylosed. This solid crust, forming the skeleton of crustacea, is thrown off periodically from every part of the trunk, and even its most delicate appendices. This is done by the animal first detaching the cutis and muscles from the inner surface of the old shell, then excreting from the surface of the cutis a new layer of epidermis, then a deposit of colouring matter, and within this the calcareous materials of the new shell, the old having been broken off in detached pieces in succession from all parts of the body.”—pp. 39-41.

To place such animals as the lobster and crab in the same class with the soft *tænia*, or earthworm, may, at first sight, appear an instance of far-fetched effort at classifying the works of nature from analogies; but the difficulty ceases on an examination into the points of resemblance in such cases, and admiration of the gradation and harmony in the changes by which parts are modelled, and adapted for different circumstances in life, takes the place of incredulity. Indeed, the date of the discovery of the analogy in question is only a few years back, the merit of it being due to Professor Dumeril; nor is the alliance more unnatural than that, long since admitted, wherein the human being, the bat, and the enormous whale—animals inhabiting different elements—have been ranked together in the same class, on account of the similarity found to exist between them in the general conformation of their bodies. It may be, perhaps, that the transcendental anatomists have, like the phrenologists, to a certain extent out-strode their proofs in arriving at certain conclusions of this nature; and, perhaps, some of the readers of the “*Outlines of Comparative Anatomy*” may be disposed to indulge in criticisms on the author,

for having followed somewhat too closely in the same path; but the majority will be of opinion, that an exposition of the present state of the science was due from him to the public, and that the author has not exceeded judicious bounds in his disquisitions.

The fourth section treats of "*the Organs of Support in the Cyclo-gangliated, or Molluscous Classes,*" which are subdivided as follows: Tunicata; Chonchifera; Gasteropoda; Pteropoda; and Cephalopoda.

"The external skeletons of the molluscous animals are consolidated by the carbonate of lime, without the phosphate which is common in the other great divisions of the animal kingdom. This earthy matter is secreted from the skin in successive layers mixed with a glutinous coagulable animal matter, which gives firmness and tenacity to the whole mass, and the skeletons are not exuviable, as in the other articulated classes. From the low condition of all the organs of relation in the molluscous animals, they are less able to perceive, or avert, or escape from danger than the free and active articulata, and they accumulate and preserve all the successive layers of their rocky covering permanently in contact with their surface. The shells of these animals are remarkable for their want of symmetry on the two sides of the body, the want of unity in their plan of formation, and their inconstancy in animals of similar structure."—p. 42.

"XIV. *Tunicata*.—The tunicated animals have no external shell nor internal solid parts, but are covered with a tough, elastic, homogeneous tunic, in form of an enveloping sac, with a respiratory and an anal orifice. This exterior sac is the analogue of the valves of conchifera, and has the muscular fibres of the lining mantle inserted into its inner surface, as in the shells of bivalvia. It presents every variety of colour and consistence in the different species, and has often a coating of extraneous particles of shells or gravel adhering to its outer surface. Sometimes it extends at its lower part into numerous short processes, or into a long peduncle to attach the body to rock, or other hard substances. This exterior cartilaginous skeleton is most dense, thick, and opaque in the larger isolated forms of ascidiæ, and is most soft, delicate, and transparent in the aggregated or compound forms of tunicata. Two very dissimilar kinds of tunicated animals are represented in Fig. 19, where 1, is the *cynthia papillata*, and 2, the *pyrosoma gigantium*; the first is permanently fixed, like most of the animals of this class, and the second is an aggregate mass of numerous individuals, which floats by their combined movements freely through the sea."—pp. 42, 43.

XV. *Conchifera*.—Most of the conchifera have bivalve shells; but some, as the pholades, possess small supplimentary pieces at the hinge of the valves, and are thence called multivalves. The valves grow by the successive additions of larger

layers to their inner surface, and the limits of these superadded layers are commonly marked by distinct striæ on the outer surface of the shells.

“ As these shells of conchifera are extravascular exudations from the surface of the mantle, they are incapable of growth but by superposition of new parts, and the various spines and laminæ, which are so often developed on their exterior surface, are mere depositions from the edge of the mantle, and indicate former positions of the margin of the valves.”—“ The waved disposition of the calcareous particles in the layers of these shells, often gives them a beautiful nacreous lustre, especially in the more pellucid internal layers, which constitutes the mother-of-pearl; and when spherical globules of this matter, composed of concentric layers enveloping some extraneous particle, are secreted by the mantle and unconnected with the shell, they form the rich pearls of commerce. The edge of the mantle sometimes extends itself beyond the margin of the valves, so as to touch some extraneous body, and by their exuding the usual calcareous and albuminous matter, it causes the contiguous surfaces to become cemented together; in this manner the oyster glues its shell immovably to the rocks at the bottom of the sea.”—p. 45-47.

“ XVI. *Gasteropoda*.—Many gasteropods have no shell, as the *scyllæa*, the *tritonia*, and the *doris*; some have a thin calcareous lamina within the skin of the back, as the *aplysia*, and some have an external shell so small as to cover only a portion of the animal's surface, as the *testacella*, the *cryptostoma*, and the *carinaria*. The shell is perforated in the *haliotis*, the *fissurella*, and the *emarginula*, and it is composed of eight transverse parallel imbricated pieces in the *chiton*. It is, however, most generally in form of a hollow cone, wide and open at the base, closed at the apex, and more or less convoluted or spiral. This cone has been considered as analogous to the two valves of the conchifera united together. It is short, wide, and nearly straight in the *patella*, more lengthened, narrow, and slightly bent in the *dentalium*, a little twisted in the *crepidula*, the *haliotis*, and the *capulus*, and it revolves round its apex in a single plane in the *planorbis* and some of the *helices*, forming a flat disk like an ammonite. In most of the gasteropodous shells, the plane of revolution is constantly changing during growth, so as to cause the cone to turn to the right side, and to revolve in a spiral manner round an axis or pillar called the *columella* of the shell. This spiral twist appears to be the result of the descent of the foot over the columella, and the influence of the great centres of the circulating and respiratory systems on the left side of the body; so that the apex of the spire is on the right side of the animal, and the canal of the shell for respiration is on the left side. In a few reverse shells, where the spire lies to the left side of the aperture, the circulating and respiratory organs are found transposed to the right side of the animal.”—pp. 47, 48.

The shells of the gasteropoda vary remarkably with their age. The following account of the peculiarities of that beautiful class of shells, the cypreæ—the common ornament of the chimney-piece—will be new to some of our readers.

“The young and the adult shells of the *cypræa* are scarcely recognizable as belonging to the same individual, from the changes of form they experience at maturity. The form of the young shell of the *cypræa exanthema* is represented in Fig. 23. 2, where the aperture is wide, the upper lip thin and even, the canal (*b*) projecting, and the apex (*a*) of the spire extended and free. But in the adult form of the same shell the aperture is contracted, narrow, and serrated, the upper lip is thickened and rounded backwards, the canal is converted into a groove, and the whole of the spire is covered and concealed. These adult changes in the *cypræa* are produced by the extension of the sides of the mantle over the upper and lower lips of the shell, and now the new layers are added to the exterior surface, as if it were an internal shell, and the line of junction of the two enveloping folds of the mantle is marked by a transverse discoloration or groove on the exterior of the shell, along the whole of its convex dorsal part. By this addition of new layers to its whole exterior surface, the adult *cypræa* has a smooth, glistening, naked, and variously coloured exterior, like the interior surface of most other shells, and can present no rough epidemic covering when arrived at that state.”—p. 50.

How unprofitably, then, does the mere conchologist spend his time and labour in attempting to name and classify his thousands of shells from a mere examination of dried specimens. As well, nearly, might he attempt to draw distinctions between individuals of the human species from the colours and shapes of their garments, as persevere in endeavours of this kind with respect to animals, the outward coverings of which change with each step of their growth, and even vary in every habitat. No doubt our catalogue of shells is unnecessarily lengthy by reason of this injudicious mode of studying them. It is only by being taken up as a branch of comparative anatomy, that the study of conchology can be brought to any definite or useful limits; and with a view to promote this object among the class of students, into whose hands the present work is most likely to fall, it would have been well had the author occasionally introduced the English names of the animals, not only in this particular department but in every other, in order to facilitate their researches. Nothing so much puzzles and discourages beginners in any study as the frequent occurrence of hard names; and as it is in the character of a manual that this book will be principally used, the more intelligible and attractive it were rendered the better. The abandonment of old, familiar,

and well established names for natural objects, and the substitution in their stead of others of foreign importation, is a growing evil in this country, and one of just complaint with the uninitiated in science, who are thus embarrassed and retarded in their studies by being obliged to learn a new nomenclature for objects well known if spoken of in familiar language, but which they are now forced to come at by a sort of synthetic method, commencing at the wrong end, viz., the unknown word, and ending, after a tedious retrograde search, often throughout a variety of authors, at its interpretation. Who is there who has not experienced this absurd and unnecessary difficulty in his first attempts at acquiring a knowledge of comparative anatomy? Let those who trade on ignorance acquire their ignoble gains by bewildering still further the ignorant; let the shop-man, by the exhibition of some unintelligible terms as *eukeirogenion*, *pantheon phusitechnicon*, or the like, lead his gazing customers into a belief that his art must excel that of his neighbours, or his warehouse be the repository for goods of extraordinary value or rarity; but let the philosopher, whose object is to demonstrate the simplicity and beauty of nature's works, avoid all such unnecessary parade, and deal in intelligible language: or if the science he treats of require a language of its own, let such at least be accompanied by the necessary interpretation.

“XVII. *Pteropoda*.—As the pteropodous animals are not provided with a muscular foot to creep upon a solid surface, but are all organized to swim freely through the sea by means of muscular expansions like fins, they are never encumbered with a massive or heavy skeleton. Their skeleton, when present, is generally external, extravascular, thin, pellucid, horny, or vitreous; it is univalve, unilocular, of various forms, generally without a spiral twist, capable of enveloping the whole body, and it is destitute of an operculum, as in most of the light shelled floating gasteropodes, and the swimming testaceous cephalopods.”—pp. 51, 52.

A figure of the cymbulea is annexed, represented as swimming with its expanded fins; and covered behind with its thin, lengthened, fusiform, carinated, and serrated shell.

“XVIII. *Cephalopoda*.—In this highest of the molluscous, and of all the invertebrated classes, we trace the gradual disappearance of the external unorganized shells of the invertebrated tribes, and the commencement of the internal organized bones of the vertebrata. The shells are sometimes external, as in the *nautilus*, and sometimes internal, as in the *sepia*, and they are consolidated by the carbonate of lime, as in the lower molluscous classes.”—p. 52.

A figure of a section of the *nautilus pompilius* is given to serve as an illustration of the form and structure of the external polythalamous shells of the cephalopods.

“The shell of the *sepio*, affords an example of an internal shell belonging to this class. It is contained within the substance of the dorsal part of the mantle, and consists of numerous nearly flat layers, placed within each other, the first formed being at the outer part and posterior termination of the shell, and the succeeding new layers extending always more forwards than the edges of the old. These compressed layers are connected together by innumerable, very minute tubular fibres; so that there is a great analogy between the structure of this internal laminated shell, and the external polythalamous shells, where the successive laminæ are more detached.”—p. 53.

“In this highly complicated class of molluscous animals, which approach so near to the cartilaginous fishes in the structure of many of their internal parts, we already find several internal rudimentary pieces of an organized cartilaginous skeleton. The brain encompassing the œsophagus is enclosed in a large curved cranical bone, which forms also part of the orbits on each side, contains the cavities of the ears, and has numerous muscles inserted into it. Other cartilaginous, organized pieces are seen extending downwards from the back part of the skull, like the rudiment of a vertebral column. Two clavicular pieces in front unite to the first rudiments of a sternum, and attach the sides of the mantle to the trunk, and there are generally two scapular pieces, more or less firm, extending along the sides, to which the muscles of the lateral fins are attached.”—p. 55.

These extracts, it will be seen, are principally such as bear reference to generalities: for the details in illustration of them, the student will derive much satisfaction by a reference to the original.

Fifth section, “*Organs of Support in the Spini-cerebrated or Vertebrated Classes*.” However desirous we might be of entering as fully into the skeletology of the vertebrated classes, as we have into that of the in-vertebrata, the limits allowed in the pages of a Journal like this will not allow of such proceeding; nor indeed could any justice be done, by the attempt, either to the subject or to the work itself. A few extracts from the general observations on each section will, therefore, close our notice of the present number.

“In the lowest vertebrated animals we still find traces of the external unorganized shells of inferior classes, in the form of calcareous scales in fishes, and of horny plates in many reptiles; but these are generally reduced to small detached pieces, and do not serve as organs of support. The organs of support in the vertebrated classes are placed within the soft parts, so that these animals are more intimately

related to the properties of surrounding objects and outward nature, by the sensibility and delicacy of their surface. Their skeleton being internal, it is not exuviable in a mass, and as it cannot grow and preserve its proportions by the simple addition of layers to its surface, it is organized or permeated in all directions by vessels which take away and replace its materials atom by atom. The phosphate of lime, which forms the chief consolidating earth, increases in its proportion to the gelatin as we ascend through the vertebrated classes; so that the bones of the lowest fishes are soft, flexible, and cartilaginous; those of hot-blooded classes are of great density and strength, and those of reptiles possess intermediate properties. The bones have a fibrous structure, which is the best adapted for the transmission of minute vessels through their texture. They form solid levers for the motions of the body, and cavities to protect its viscera. The most constant and the first formed part of the skeleton is the vertebral column, which is composed of moveable vertebræ, each of which consists of several elements that are found most isolated and distinct in the lowest classes, and in the embryo state of the highest.—p. 56.

“ The appearance of the entire skeleton of vertebrated animals is greatly varied by the difference in the position of the ribs, or of that part of the column where the para- and cata-vertebral elements are extended over the great viscera of the trunk. In fishes, as shown in the annexed figure, (Fig. 29. 3,) and in cetaceous mammalia, the fixed, ribbed, and thoracic part of the column (*a*,) is placed near its anterior extremity, and all the posterior portion is freely moveable, to give impulse to the tail in swimming. In birds, where the head and neck are used as a hand and arm, for all prehensile purposes, the fixed thoracic portion (*a*,) of the column is placed near to its posterior extremity, and the anterior portion is free for extensive motion. Most quadrupeds and reptiles, balanced on two pairs of extremities, hold an intermediate place, and have the ribbed and solid portion (*a*,) of their trunk placed near the middle of the column.—pp. 59, 60.

“ XIX. *Pisces*.—The bones of fishes contain less gelatine, and a larger proportion of water than those of higher classes, and are less dense and compact in their texture. The soft bones of cartilaginous fishes yield more water than those of osseous fishes, and they contain the soluble salts of soda, the chloruret, the sub-carbonate, and the sulphate, while the more dense bones of osseous fishes are strengthened, like those of higher classes, with the more insoluble phosphates. The bones of fishes resemble those of the embryos of higher animals, not only in their soft, gelatinous, or cartilaginous character, but also in the isolated condition of all the elements, or centres of ossification, of the more complicated bones, especially of the head. The skeleton of fishes consists almost entirely of the vertebral column, from the extremity of the face to the end of the tail, like that of the embryos of mammalia at a corresponding stage of their development.—p. 60.

Here follows a minute description of the skeletons of osseous

and cartilaginous fishes, in which will be found many interesting remarks on the analogies and differences between the several regions of the trunk in this class of animals, and the corresponding parts in others, above and below them in the scale of nature.

“XX. *Amphibia*.—The amphibious or batrachian animals commence their career as fishes, with one auricle and one ventricle, and breathing by means of gills, which in many are retained through life, but in their adult state they acquire a pulmonic respiration, and a pulmonic auricle of the heart, and this early aquatic life and subsequent metamorphosis affect the whole condition of the skeleton, and the forms of the several bones. The skeletons of the amphibia come nearest to those of fishes in the imperfect ossification, and the thin, diaphanous, elastic character of the bones, in the loose condition of the bones of the face, and in the imperfect development of the ribs. The perennibranchiate amphibia, and the tadpoles of the caducibranchiate species, present the softest and the most detached condition of the bones, and the most fish-like form of the whole skeleton. Their vertebral column is prolonged backwards to a great extent, as an organ of motion; their arms and legs are wanting, or are very imperfectly developed, and their os hyoides, like that of a fish, supports a variable number of branchial arches, as seen in the annexed figure of the skeleton of the *proteus anguinus* (Fig. 33.)”—p. 68.

“It is in the *anurous* amphibia, as the common frog, that we find the most solid and fixed condition of all the bones, and the nearest approach to reptiles and higher classes in the structure of the different parts of the skeleton. The vertebræ of the tadpole are formed like those of a fish, with two cup-like cavities, but by the ossification and anchylosis of the intervertebral soft substance, it becomes fixed to the posterior end of the body of each vertebra, so as to change their forms almost to those of reptiles. A great portion of their vertebral column, and of their os hyoides, and their branchial arches become absorbed, their legs and arms became developed, and many of the coccygeal vertebræ unite to form a single piece; so that these anurous highest kinds of amphibia pass through the inferior forms of their class before arriving at their perfect state.”—pp. 69, 70.

“We thus observe in the adult anurous amphibia a greater consolidation of the whole texture of the bones, and of the different parts of the skeleton, than we find in fishes; and many elements, originally separate, have become anchylosed together, which conditions prepare the solid frame-work to support and carry the whole fabric through a much rarer medium than the dense water in which they commenced their career, and in which the fishes permanently reside.”—p. 72.

“XXI. *Reptilia*.—The bones of *serpents* are more compact, white, dense, and elastic than those of the other orders of reptiles;

but their skeleton is the most deficient in its parts, consisting almost solely of the vertebral column, without legs or arms, or a pelvic or scapular arch, or even a sternum to connect the ribs, as seen in the skeleton of the *boa constrictor*. With this simple skeleton they are able to creep quickly on the ground, to combat with their prey, to climb trees, to spring into the air, and to swim rivers and lakes.”—p. 73.

“The *saurian* reptiles have the skeleton more complete than the serpents, as they possess a complex sternum, and scapular apparatus, a fixed pelvis, together with atlantal and sacral extremities; but the transition from the one form is very gradual from the serpents with the rudiments of pelvic and scapular bones, to the bimanous and the biped lizards; and from these to the regular saurians with four feet, and to the more solid and complete forms of the skeleton presented by the crocodilian reptiles. By the increased development of all the processes of the vertebral column, we perceive the preparation for more solidity in the articulations, and more limited motions in that part of the skeleton; the locomotion is now to be effected by the arms and legs, and not by the vertebral column, as in most of the lower vertebrata. The large bones of the sauria present a coarse fibrous structure, contain a large proportion of animal matter, and have a cancellated loose texture internally, where we find tubular cavities in the birds and mammalia.”—77.

“The *chelonian* reptiles differ from the sauria in having the ribs immoveable, and from the serpents in having arms and legs; but their skeleton retains the ordinary conditions of that of the class in the coarse fibrous texture of the bones, in the want of continuous cavities in the long bones, and in the permanent separation of the cranial and other osseous elements. The cervical and the coccygeal vertebræ are those which alone are moveable, and nearly throughout the whole column their bodies present the usual concavity at their anterior end, and convex termination behind. The vertebræ of the trunk have a lengthened form, as seen in the *caretta caouana*, and their bodies, their laminæ, and their spinous processes are connected only by sutures. There are eight pairs of ribs united to each other by sutures, and attached between the bodies of the vertebræ. By their union with each other, and with the expanded spinous processes of the dorsal vertebræ, they form the upper shield or carapace.—pp. 81, 82.

The figures chosen to illustrate the anatomy of the skeleton in these animals, give much satisfaction to the reader.

The skeletology of birds is prefaced by the following interesting observations.

“XXII. *Aves*.—The bones of birds are more compact, white, dense, and brittle than those of any other class; they have thinner parietes, their internal cavities are proportionally larger, and for the

most part they contain air in place of marrow. From the great extent of their respiration, and the consequent increased energy of all their functions, ossification proceeds in birds to the greatest extent, not only in the consolidation of the several pieces of the skeleton, but in the anchylosis of the separate elements and separate bones with each other, throughout the skeleton, and in the consolidation, by phosphate of lime, of cartilaginous and tendinous parts, not ossified in other classes. In the young state the bones of birds are filled with a thin serous marrow, like those of reptiles, and this is displaced, by the admission of air during growth, to a very variable extent, in the different orders of this class, the air being admitted most extensively in the high flying rapacious birds, and least in the heavy swimming palmipeds. There is greater uniformity in the skeleton of this, than of the other vertebrated classes. The arms are here adapted solely for flight, the legs for support, and the head and neck are long and extensively moveable, as organs of prehension; hence the peculiar forms presented by these regions of the skeleton in birds, as seen in the skeleton of the griffon vulture, *vultur fulvus*. As the body is supported wholly on the legs, the toes extend to a great length, to afford a broad base, the legs are placed forwards upon the sides of the pelvis, the trunk is inclined backwards upon these organs of support; the neck and head are proportionally elongated, to reach the food upon the ground, and the arms and hands are folded longitudinally along the sides of the trunk, as in the bats. The trunk of birds is almost as fixed as that of a tortoise, to give strength to the muscles employed in flight, and the vertebræ of the neck and tail are almost alone moveable. The rapid ossification and anchylosis here affects not only the bones of the skull, but the whole bones of the pelvis, the lower jaw, the scapular arch, the clavicles, and the sternum. This tendency to ossification affects the sternocostal cartilages, the tendons of the muscles of the legs, the sclerotic coat of the eye, the rings of the trachea, and the inferior larynx.—pp. 85, 86.

“XXIII. *Mammalia*.—The bones of mammalia are intermediate in density and compactness of texture, and in the extent of their anchylosis between those of birds and those of reptiles. They have generally thick and solid parietes traversed by numerous sutures, which have disappeared in birds, and in the interior of the long bones are large cavities filled with marrow, which in birds are filled with air, and in reptiles with a cancellated structure. The most imperfect forms of the skeleton are presented by the cetaceous mammalia, where the vertebral column, as in fishes, is the chief organ of progressive motion, and almost alone developed. They have no sacrum, nor pelvic extremities, and their cervical vertebræ are more or less anchylosed together. Their long bones are almost in the condition of those of reptiles, filled with a loose, internal, cancellated structure, containing a thin, serous, or oily marrow, and all their bones have a coarse, fibrous structure compared with those of land

mammalia. The head is still extended in a straight line with the vertebral column, the arms are constructed for swimming, and the tail is expanded horizontally, for the vertical movements of the body, required by their aerial respiration, as seen in the skeleton of the porpoise."—p. 96.

The descriptions of the skeletons in the other tribes of mammalia, commencing with the herbivorous cetacea, and advancing thence through the ruminantia, pachydermata, monotremata, carnivora, insectivora, chiroptera, and quadrumana, up to man, are all so equally judicious, that it would be impossible to select one part more interesting than another. To have prevailed on the student to look into the original, will, therefore, be conferring on him a greater obligation, than to have attempted furnishing him with an imperfect analysis of its varied contents; in fact, every section may be considered as a clever and well digested compendium on the subject, and as such scarcely admits of abbreviation. For this reason it has been found necessary, in recommending the work to the public, to proceed rather by making extracts from particular passages, than by attempting an analysis of the whole.

On the Appearance of Cholera at Sunderland in 1831 ; with some Account of that Disease. By JAMES BUTLER KELL, Esq., Surgeon to the Eighty-second Regiment. Edinburgh, 1834.

MR. KELL has acted wisely in not publishing sooner, for the minds of medical men, as well as of the public in general, were in such a state of excitement with regard to the subject of cholera, that cool reasoning and sober judgment seemed altogether to have deserted the adverse ranks of those who engaged in the *war to the knife*, which raged with such fury between the contagionists and non-contagionists. Many of our friends, and not a few of our subscribers, supposed that we, as Journalists, would have mingled in the fray; and it was expected, from our known prowess, that our onslaught would have been terrific; in fact, our flatterers (and truth to tell, we love the race) whispered in our ear, that our aid would at once decide the fate of the still doubtful battle; so that we might calculate on the glory of conquest almost without incurring the odium of combatants. We were not, however, to be seduced from a steady perseverance in the plans we had formed at the commencement of hostilities; and although the presence of so many

belligerents forced us to make a somewhat ostentatious display of our store of weapons, yet all this was done merely on the principle of self-defence, and in consequence of our conviction, that an *armed neutrality* could alone secure for us the continuance of the literary peace we so much desired.

The duties of Surgeon to the 82d Regt., quartered at Sunderland at the time the cholera broke out in that town, naturally forced Mr. Kell into notice, while his previous knowledge of the disease in the Mauritius, where he had acted for eleven years as regimental surgeon, peculiarly fitted him for watching and recording the occurrences which accompanied its rise and progress. The pamphlet before us is written with a view of examining in detail the evidence brought forward by the contending parties, as to the question, whether cholera was imported into Sunderland. It is ably and impartially written, and, in our opinion, quite conclusive in favour of importation. Mr. Kells, it is right to observe, was looked upon with an evil eye by all those inhabitants of Sunderland, whose commercial pursuits rendered them anxious to conceal the existence of cholera; and he had to endure much censure in consequence of the honest opinion he communicated to Government, the moment he had ascertained that cholera had really made its appearance in the town. Were we to take the trouble of collecting the various testimonies published in the provincial and metropolitan newspapers of the day, we could accumulate a mass of evidence sufficient, we think, to convince the most sceptical, that no cholera existed in Sunderland, or any where in Britain, at, or even long after, the period referred to. In fact, never had a disease to contend against so formidable a mass of incredulity; and never were the few, who saw and proclaimed the advance of a coming plague, assailed with such diligent rancour and malignity. We regret extremely that our limits do not permit us to follow Mr. Kells in the details he gives concerning the first origin of cholera at Sunderland, details, which, as we have already stated, prove beyond a doubt, that the disease was imported. Were we to attempt an abridgment or analysis of this part of Mr. Kell's work, we would be guilty of an act of injustice both to him and to our readers; we must content ourselves, therefore, with recommending a diligent perusal of this pamphlet to those who wish to investigate the question of contagion. The following passages speak volumes on the subject:

“ From personal recollection, as well as from the many well authenticated statements published of the successful exclusion of cho-

lera from populous places, by prohibiting intercourse between those in health and the infected, I formed the determination of recommending to the officer in command of the troops at Sunderland, the closing of the barrack gates, and the detention of the troops in quarters.

“ The barracks are situated at the southern extremity of the High-street; on the east the sea and roadstead lie in front, and the extensive moor bordering on the sea is situated at the south; on the west the principal gateways, and the barrack wall, form one part of Warren-street; and on the opposite side, distant from thirty to forty yards, are situated houses from three to four stories high, occupied as lodging-houses, or by people in public business. On the north-east of the barrack wall, distant ten or twelve yards, are situated numerous neat and newly built cottages, each capable of containing one family, called “ Pilot’s Row.” The situation of the barracks and houses surrounding it, is elevated at a considerable height above the level of the sea. The barracks are commodious, airy, and distant from the wall about forty feet, and afford ample accommodation to four hundred people, including the families of soldiers; and at the time the disease prevailed they were fully occupied.

“ On the 1st of November the existence of spasmodic cholera having been unanimously admitted, and officially reported to Government, on the following morning, at my request, the barrack gates were closed, and the entrance of strangers limited to those on urgent business. From that period to the 6th of November, only one case of the disease had been reported in town; however, on the latter day, many cases and deaths from cholera were reported to have occurred in Silver-street, in the vicinity of the barracks. I immediately recommended that the soldiers should be confined to quarters, and the women and children were subjected to the same restraint in three days after.

“ To procure the supplies necessarily required by four hundred individuals, the servants of officers, and a few men from each company in charge of confidential non-commissioned officers, were permitted into town, once each day. There fortunately did not exist any duty for soldiers outside the barracks,—the usual guard of which was increased, and at sunset a picket mounted, when the sentries were increased, and the men so employed relieved every hour, from the circumstance of cholera occurring more frequently during the night-time.

“ Independently of these precautionary measures, during the day, and frequently after tattoo, roll-calls were ordered, and each individual within the barracks was seen by me in the course of the day; it was therefore evident, that all the practicable precautions which human prudence could dictate to avert the calamity had been adopted; and to the prompt and zealous co-operation of Major, now Lieut.-Colonel, Hogarth, and Major Firman, his successor in the command, to every measure recommended, I felt deeply indebted.

“ The situation in which the inhabitants of the barracks were placed was unusual, and to soldiers, whose habit of life and profession are in opposition to apprehension, it was difficult to reconcile them to the necessity of the restraint which was imposed on them. In this instance, as affecting the reserve companies of the 82d Regiment, it was particularly so, from the majority of the men having been young soldiers, and enlisted within the preceding twelve months ; it was therefore natural to conclude, that individuals of this description had not patience to suffer, or to rest satisfied with the measures adopted for their safety. Under these circumstances, to enliven the dull tedium of the months of November, December, and January, amusements were encouraged and patronized by the officers ; the games of cricket, quoits, and foot-ball, were indulged in, and theatrical performances at night twice or thrice a-week. To vary the monotony of the scene, as well as to inspire a just confidence in the protecting power of Providence in a moment of peril, the soldiers were marched as usual to the church. The place of worship resorted to by the troops is a chapel of ease, about thirty yards distant from the south barrack-gate, and in which the military have ample and separate accommodation from the few civilians who generally attended. The indulgence thus conceded to the Protestants was naturally granted to the few soldiers who professed the Roman Catholic religion, and the men of that persuasion were conducted to the place of worship by the non-commissioned officers of their own religion. I have entered into a more minute detail of the sanatory restrictions which were adopted to insure the troops at Sunderland from a visitation of cholera, than might seem necessary ; yet I have done so, in consequence of these arrangements having been impugned at the cessation of the disease in that town, when their salutary effects were indisputably established.

“ For the progress of cholera, I must refer to the former pages of this work ; and although the disease existed in the vicinity of the barracks from its first occurrence, it did not actually appear in the houses immediately surrounding them, until early in December. In the row of cottages in the north-east of the barracks, called ‘ Pilot’s Row,’ many persons died of that disease ; and immediately after, cholera, in its most intense and malignant form appeared in the families residing in the houses immediately opposite, and close to the principal entrance of the barracks, and the officers’ quarters. The disease seemed to be confined to three or four families, all of whom in succession suffered severely ; and to the medical visitors, as well as the readers of the periodicals of the day, the state of disease in Warren-street is as yet familiar.

“ At this period of distress, the patience of all parties in the barracks was quite exhausted, yet they were convinced, from the continued exemption from the pestilence around them, of the beneficial effects which resulted from the quarantine established. Towards the latter part of December, cholera was less frequent in its occur-

rence in the town, and was reported to have ceased in the families surrounding the barracks. However, on Christmas Day, a man named Ellemore, residing in Warren-street, died of the disease, and his wife in two days after; the latter person I visited at the request of a medical friend, a few hours before her death. We found the room comfortable, and the utmost attention paid to ventilation and cleanliness; and on his inquiring after the fluids discharged from the stomach and bowels, the attendants stated that they were immediately removed, and deposited in the gutter of the public street. The illness and death of the husband of this woman is fully illustrative of the evil I formerly referred to. The man was taken ill at an early hour in the morning; the medical person employed to attend on the members of the society to which this patient belonged could not attend, in consequence of other engagements; at one or two o'clock in the day, another medical man visited, and the patient died that evening. After ascertaining the circumstances of the noxious fluids discharged from patients ill with cholera being immediately removed to the public street, and that a similar practice had been followed in regard to the other people who had been ill or died of the disease in Warren-street, I immediately addressed a letter to the officer in command, to request his calling the attention of the Board of Health to the existence of this nuisance, and the danger likely to ensue to the troops, as well as the inhabitants, from such a practice. It had been repeatedly, and in a great measure correctly, stated, that the cholera would not commit the ravages in this country that had followed its course in milder climates; and to the heavy and foggy atmosphere of November and December, on the north-east coast of England, may be attributed the escape of many from a pestilence, to the source of which they were unconsciously exposed.

“ On Christmas Day, the long interval of seven weeks had elapsed from the period at which the soldiers and their families were confined to barracks, and during that time they enjoyed good health, and *remained free from that disease, which destroyed many within a few yards of their quarters, thus affording an irresistible proof of the salutary effects of the measures adopted.* From the favourable reports published of the state of health in Sunderland at that period, the utmost impatience was manifested by the soldiers at the continued restraint imposed on them, and after the festivities of Christmas Day, many of them contrived to go over the wall into town; however, the major part returned in the course of the evening, and all of them by the following morning.

“ In mentioning this circumstance, I cannot refrain from expressing my regret at an occurrence, the impropriety of which was in a great measure effaced by their former forbearance amidst so many privations; yet this transgression could not, in my opinion, impugn the advantages which the former state of seclusion had afforded; as it will appear, on a reference to the official return of cholera published at the council-office, that on that day, as well as

before and immediately after, but very few cases of cholera were reported in Sunderland and its suburbs.*

"The disease, however, continued to linger, a case of it occasionally recurring, and not until the first of February was the town declared free from it, on which day the barrack gates were opened, and, after an interruption of three months, the intercourse of the military with the inhabitants was re-established."

TO THE EDITOR OF THE DUBLIN JOURNAL OF MEDICAL AND
CHEMICAL SCIENCE.

Armagh, Feb. 17, 1835.

SIR,

In Dr. Cranfield's work on Cholera, as reviewed in the November Number of your Journal for 1834, I find the Doctor takes a good deal of credit to himself for, and attaches a very proper degree of importance to, the classification there adopted. The learned reviewer also bestows no small credit on the Doctor for this arrangement. Now, Sir, I am not a little astonished to find, that neither Dr. C., the reviewer, or yourself, ever thought of taking a retrospective view on this subject; if you had, it would have at once appeared, that twelve months before Dr. C.'s work was heard of I had adopted and published the same arrangement or classification of cholera in the November Number, 1833, of your own Journal. I now beg, Sir, that you will compare the two, and you will find, that not only has Dr. C. adopted my classification, but has used also nearly the very same words. As to the merits or demerits of comparative modes of treatment I shall not here speak further than to say, that no one mode of course can be at all applied to all the varieties of cholera. The acetate of lead may be useful in some, but I feel convinced, that a plan lately introduced by me into our Cholera Hospital here, and since adopted by Dr. Cuming in some bad private cases, will be found equal to any other; it consists in using pills of ammoniated copper every hour, which not only arrest the spasms but also the discharges, and using at the same time pills of calomel and opium every third hour *until the gums are made tender*, which seems still to be the best means of preventing the secondary fever, or perhaps I should say more properly, the development of the fever when the choleric symptoms have been in some degree removed. I expect, Sir, as a warm friend and primitive subscriber to your work, which is our only national organ of medical information, you will take an early opportunity of doing me justice in this affair.

I am, Sir, your's truly,

JOHN COLVAN, M. D.

Physician, Armagh City Fever Hospital,
and one of the Physicians to the Cholera Hospital, Armagh.

* Remained 22d Dec. 6 cases.
23d Dec. 7 do.
24th Dec. 8 do.

Remained 25th Dec. 9 cases.
26th Dec. 6 do.
27th Dec. 7 do.

SCIENTIFIC INTELLIGENCE.

PATHOLOGY AND THERAPEUTICS.

Record of an Epidemic Gangrene of the Spleen, which occurred in the village of Mandrowo, in Russia, in 1831, by Dr. Tchetirkin. Translated from Hecker's Annals of Medicine, by F. Churchill, M.D.

I. *Details of the Investigations of Medical Police concerning this Disease.*—On a requisition from the commanders of the Finland dragoon regiments, Captains Obersten and the Chevalier Dmitrejew, Jan. 28th, 1831, in consequence of a letter from the authorities at Walinka, and of my previous verbal communications, an investigation was undertaken by me, in the presence of MM. Antonow and Glazunow, as to the epidemic prevailing at that time in the village of Mandrowo, belonging to Count D——, and we obtained the following results :

On the 28th Jan., Wassily Lobow, administrator of the village of Mandrowo, came and informed me, that in that place, which is seventeen wersts from Walinka, a servant on the estate, by name Andrew Klimenkow, had been attacked on the 20th Jan. with an intense burning sensation at the pit of the stomach, “malaise,” efforts at vomiting, and pain in the belly, especially in the left side, about the situation of the spleen. These symptoms increased in violence, especially the sensation of burning heat at the pit of the stomach, and the patient died on the second day.

On the 25th of Jan. another servant, Peter Medwedenko, complained of a similar attack, with the addition of frequently recurring cramps and vomiting of a green fluid, he died in twenty-four hours.

In the evening of the same day, (25th,) a third servant was seized in like manner ; he suffered much from the burning sensation at the pit of the stomach and pain in the belly, and died on the 27th. The administrator further told me that all these died in possession of their faculties, and that soon after death putrefaction commenced ; that all were men of regular habits, living in separate houses, and only one of them served occasionally in the domestic establishment of the Count ; hence he concluded, that there was no ground for attributing their death to a common cause. In addition, on the 28th, symptoms of the same disease shewed themselves in a female, two other servants, and a peasant.

As I suspected that the so called *Siberian epidemic* might be commencing here, I advised the administrator to inform the local govern-

ment of the occurrence ; I myself, at the same time, reported it to the commanding officer, in order, by making it known, to interrupt all communication with the villagers of Mandrowo. Without loss of time I dispatched one of my assistant surgeons, upon whom I could entirely depend, into the village, with instructions for guarding against contagion, and with medicines for the sick. As I, from the symptoms related to me, concluded the spleen to be in an inflamed condition, I prescribed venesection for each newly attacked patient, with leeches to the left side, and a drink of acidulated water, and moss-berry syrup.

From the absence of the official authority, and from the shortness of the winter's day, it was impossible to undertake the investigation the first day ; but on the day after our arrival, (Jan. 29,) I sought out the sick early in the morning, and found four in the village. They all complained of an intolerable sensation of burning at the pit of the stomach, of heat and pain in the upper part of the belly, and especially at the left side, about the situation of the spleen ; pressure on this part was very painful ; they had nausea without discharging the stomach, and could not lie on the left side ; the mouth was dry, without great thirst, and they were besides annoyed by strong palpitations of the heart. After a sufficient bleeding and the acid drink, in two cases the symptoms disappeared, and the remaining two were much relieved.

After arranging all the precautionary rules, I went with the officer of the local government to examine the dead bodies, of which only one had been interred. The first subject of our anatomical investigation was Gregory Klimenkow ; the room in which he lay had been previously fumigated, and the assistant surgeon who performed the dissection, first covered his hand with oil. The deceased was about fifty years old, of a thin but strong frame. There was nothing remarkable on the surface of the body but a blue spot on the left side.

According to the relation of the wife of Klimenkow, and of his fellow-lodgers, he had really been attacked as the administrator told me, and just after death the blue spot appeared, and also a sanious discharge from the mouth and nose, which they washed off. The body exhaled no peculiarly strong putrid odour. In expectation of finding the cause of death in the belly, and also to avoid the change of position consequent upon the previous examination of other cavities, I ordered the abdomen to be first opened with care. After removing the integuments, probably on account of the cold, and the spare habit of body of the patient, no offensive smell was perceived. In the peritoneal cavity spots of inflammation were here and there observed. The stomach and intestines were distended with gas, and their inner surface inflamed.

The liver was of a light colour, but no disease was discovered in it ; the gall bladder was full of bile. At the first touch a quantity of black blood was discharged from the spleen, which was greatly swollen. A deep gangrenous ulcer was discovered at the back part

about the size of a silver rouble, from which the blood had escaped. The whole substance of this viscera was softened and filled with black thick blood. No morbid change could be detected in the chest or cranium. As there was now a bad putrid stench, owing to the escape of gas from the stomach and intestines, I ordered the room to be fumigated and purified, and the operator to wash his hands in a solution of chlorine, and I then proceeded to the second body, Peter Medwedenko, which had been placed in the charnel house on account of the stench it occasioned. This subject was about twenty years old; the face and the whole body was blueish, red, and swollen, especially the belly. Upon removing the integuments we found it less frozen than from the atmospheric temperature we expected. On the left side we found also in this case a broad blue spot, under which the soft tissues were destroyed. There was nothing else remarkable on the surface of the body. As the deceased complained during his short illness of the cramp-like pain in the side, we opened the abdomen at once, and found the spleen gangrenous, and the intestines, in several places, of a reddish colour. Further investigation was not considered desirable, on account of exposing the persons engaged to the danger of infection. The third patient who died, Andrew Klimenkow, was buried without delay, on account of the rapid putrefaction, as well as that no one suspected the occurrence of an epidemic disease.

Police researches could discover nothing of the cause which gave rise to this disease. The village is situate at a moderate elevation, near a river containing good water, the habitations are tolerably clean, and the inhabitants suffer no want of food. No epizootic or sporadic disease then prevailed amongst the domestic animals, either in this or in the circumjacent villages, which could give ground for any suspicion. The temperature of the air for more than two months had been constantly low, the thermometer standing at 24° R.; so that it is evident that there had been at no time either a general or a special cause for the production of a contagious malady. As Mandrowo is near the principal road, it might be supposed that the disease was brought there from some other place, but this is not confirmed by a close inquiry. There remains only one other conjecture, which, however, is very uncertain, as to the cause of the appearance of this disease. During the previous autumn there prevailed a contagion among sheep, but of what nature could not be ascertained, as no professional person investigated it. Now, since in this, as in all the villages of this part of Russia, the peasants traffic in salt meat, it is possible that a diseased sheep may have been killed, and its salted flesh sold to the villagers of Mandrowo, and the eating thereof have given rise to this disease. After the completion of these investigations of medical police, and after receiving the documents thereof, we returned to Walinka, where I, on the third day after the last order from the civil authorities, received an account from Surgeon Wertoglazow, who was left behind, that on the 29th inst. two more

women exhibited symptoms of the disease ; consequently the number of those attacked from the 20th to that day amounted to nine persons, three of whom died before assistance reached them, four were recovering, and two remained in a doubtful state.

After weighing all the circumstances, I have come to the conclusion, that the disease which appeared in the village of Mandrowo is the so called *Siberian Epidemic*, which is known by the name of gangrene of the spleen, (*splenitis gangrænosa*). But as we have not discovered the origin of this disease, and as we have not the requisite medical knowledge concerning it, I will not undertake to declare positively whether it is contagious or not. Although the information and experience just communicated to medical men on this subject have determined nothing touching the essence or contagious nature of this disease ; yet may the communication with such a disease be considered pernicious, and the touching the diseased bodies dangerous : hence the strict regulations laid down by government for observance in epidemic contagious maladies, are here indispensably necessary. Although this sickness observed in Mandrowo extended itself but slowly, and though some of the patients recovered under the means employed, yet I ascribe this only to the very cold weather which then prevailed, and which we know limits all contagion. For all this the infection may lurk in the village until the warm spring weather, and even be transported into other villages, and so become very fatal.

II. *Preventive Regulations of Medical Police, to be observed during the prevalence of Gangrene of the Spleen.*

1. Every communication with the village in which the disease shews itself must be cut off.

2. In the infected village an hospital must be established, and in the absence of a physician, an assistant surgeon shall be stationed there.

3. Persons attacked by the disease are to be brought to the hospital without loss of time, and the house from which the patient is brought is to be subjected to a strict inspection, and to be well fumigated.

4. The dead are to be removed from the village, and buried in a place appointed.

5. The garments, and every thing belonging to the dead, are to be washed in *ley*, and exposed to the open air. It would be better to burn the cheaper articles at once.

6. In the place where the disease prevails, touching the sick, especially with naked hands, is to be avoided : should this be unavoidable, the hands are to be smeared with oil or grease previously.

7. Especial care must be taken, that the fluid escaping from the gangrenous eschar come not in contact with the bodies of the healthy ; nor the saliva, or other discharges, with the face or eyes.

8. Persons with eruptions on that part of the skin exposed to the air, must avoid all contact with the sick.

9. In case matter from the gangrenous ulcer shall be received on

the hand, or on the face of a healthy person, these parts must be instantly washed with salt water.

10. Inquiries must be instituted to ascertain if a similar disease prevail amongst domestic animals.

III. *Prophylactic Treatment*.—It is not sufficient to avoid communications with the sick, but a regular mode of living must be adopted, and especially moderation in the use of stimulating drinks. The food which, among the common people in Russia, consists mainly of acid substances, need not be changed. As to drink, their Kwass* water, with vinegar or mossberry syrup† and Gerkenlake,‡ may be taken. With the food more salt than ordinary should be used. The rooms should be fumigated with kwass or vinegar, and kept very clean.

IV. *Description of Gangrene of the Spleen, (Splenitis Gangrænosa,)* grounded on the foregoing Cases of the Disease.—As this disease in the human subject has never been described, and since I alone was present during its appearance, and as all the cases were treated under my directions, I consider it my duty to collect the observations made on this subject.

1. *History of the Disease*.—Without any remarkable precursory symptoms, the disease first shewed itself by an unusual sensation of burning at the pit of the stomach, with an intense pain in the left hypochondrium, which gradually extended itself over the whole abdomen to the right side; nausea succeeded, with vomiting of a greenish fluid. At the commencement the tongue was dry without thirst, the appetite destroyed, the breathing heavy, the pulse frequent, (but not so quick as from the course of the disease we should expect,) hard, sometimes small, and sometimes full; the discharge from the bowels natural, and the urine scanty and of a high colour. The patient complained of a sensation of the motion of a fluid in the left side. After some days, and in the fatal cases after a few hours, symptoms of putridity appeared, intense pain in the side, meteorism, rumbling in the belly, great thirst, increasing nausea, then incessant vomiting, yellow colour of the skin, especially round the eyes, the countenance shrunk, the pulse quickened, cramps came on, with coldness of the extremities, and death ended the scene. In favourable cases, all these symptoms diminished, there remained only nausea and an unpleasant sensation in the left hypochondrium, which soon disappeared.

2. *Post Mortem Morbid Appearances*.—Putrefaction soon set in after death, and a blue spot appeared on the left side over the spleen. The spleen itself was soft, of a loose spongy texture, and full of black fluid blood, posteriorly there was a deep gangrenous

* Kwass is the ordinary drink of Russia, and is made from flour and water, by a process of fermentation.

† Mossberries, (*vaccinium oxycoccos*), which are plentiful in Russia, yield a pleasant acid drink when mixed with water.

‡ Gerkenlake is the salt water in which cucumbers have been steeped.

ulcer. The peritoneum, stomach, and small intestines, shewed spots of inflammation; the liver was of a light yellow colour, and the gall bladder inflamed but full of fluid bile.

3. *Remarks upon the Nature of the Disease.*—1. In appearance this time the disease was not contagious but epidemic, as is evident from its only once attacking two persons of the same family, of which two, one died and the other recovered. 2. In its origin it exhibited the characters of inflammation of the spleen, and yielded to appropriate treatment; only in two individuals of a bad constitution did it assume a typhoid type. 3. In the beginning of the disease no very threatening symptom appeared, which may partly be ascribed to the general character of all diseases of the spleen, and perhaps partly to the disposition to run into gangrene, which is analogous to what is observed in some other diseases having the same disposition, and in which the pain ceases entirely a short time before death. According to the statements of the attendants in the three fatal (as well as in the eleven milder) cases, this diminution of the symptoms took place on the first day, and they only perceived the whole peril of their state in the last hours of life. The attack was marked by severe pain in the region of the spleen and in the whole belly, by swelling of the belly, the pain greatly aggravated on pressure, by incessant vomiting of green fluid, and by severe cramps. 4. That the disease took on a typhoid character is shewn as well by the post mortem examinations as by the course of the disease. 5. At the commencement all the symptoms pointed out disorder of the venous system. 6. The integrity of the nervous system was preserved in all, until a short time before death in the fatal cases: the cramps which then occurred were of course a secondary disorder of the spinal system. One who died in twenty-four hours had cramps from the beginning, and from this one may analogically conclude this symptom to be indicative of the magnitude of the danger. 7. Those first attacked suffered extraordinarily, and one lived but for a short time; subsequently, however, the disease was milder. Was this owing to the nature of the disease or to the effect of remedies? The Siberian epidemic appears very often in this country, sporadically under manifold forms, and destroys a number of individuals. Shall we not hence conclude, either that this new scourge of humanity may sometimes appear without the characteristics of the plague and other epidemic diseases, *i. e.* devastating the whole country, transporting itself, and appearing sometimes here and sometimes there, or that it has not yet reached that degree of intensity which would enable it to extend its fatal influence over a larger space? It is possible that the rapid disappearance of the disease in this case may be solely owing to the continued cold. 8. This disease was not observed in cows. 9. Domestic animals remained unaffected by it.

4. *Cause of the Disease.*—It was impossible to ascertain the cause, and therefore, to avoid repetition, we refer to what has been previously said on this subject.

5. *Treatment*.—In the beginning of an attack antiphlogistic means were employed, principally bleeding, and, if necessary, leeches to the left side: this, with acid drinks, were sufficient for the arrest of the disease. When it assumed a typhoid type, it was found very useful to give the infus. acor. calam. with camphor, (gr. viii. to $\frac{3}{4}$ x. of fluid,) and enough syr. vaccin. oxycoc. to give an acid taste to the mixture; other remedies were unnecessary.

In this manner, in addition to the cases before related, Stephen Tscherwonow, Matrona Markowa, and Agraphia Korabelnikowa, were successfully treated.

The houses in which the sick lay, as well as those in which they were attacked, were purified by fumigation. All the inhabitants were recommended to use acid food and drink.

SURGERY.

On the use of Cold Water as an Antiphlogistic in the Treatment of Surgical Diseases, by Dr. Berard, Surgeon at the *Salpêtrière*.—In the writings of Hippocrates, Galen, Celsus, &c. &c., we find the use of cold water receiving the highest praise as an antiphlogistic. Blondus, an Italian physician of eminence, says—"Ego autem mirificum opus aquæ perspicies in sectis partibus non possum non mirari virtutem ejus supercœlestem." Palatius, another Italian physician, maintained, two centuries ago, that water was the only remedy for all sorts of wounds; but the most diffuse work on this subject was published by Lombard, in 1786, who gives several cases of severe wounds successfully treated by cold water.

Cold water has been advantageously employed in our own days by Samson, Breschet, Velpeau, Jobert, and others; M. Josse has particularly directed his practice in a host of surgical affections by this means. The *Gazette Medicale*, (1832,) the *Bulletin General de Therapeutique*, (March, 1834,) and the *Journal des Connaissances Medico-Chirurgicales*, (1 vol. p. 359, 2 vol. p. 65,) have inserted many notices on this subject.

Yet this curative means, far from being generally adopted, is scarcely known to a great number of surgeons; Boyer makes no mention of it in his *Traité des Maladies Chirurgicales*.

The object of this memoir is, 1st, to exhibit a simple and sure method for the topical use of cold water in the treatment of important wounds; 2nd, to show the truly admirable effects of this remedy, and the safety of its employment when properly directed.

Topical refrigerents have been at all times employed to prevent or combat inflammation. It is a common practice to submit a super-

ficial burn or a sprained joint to a considerable diminution of temperature, in order to prevent the afflux of the fluids in the tissues, towards which the irritation of the part would attract them if any other means were employed; but a partial diminution of temperature will not succeed in severe cases, for if the repellant be interrupted, the afflux of blood to the affected part will become more active, by the reaction from the cold application combining its influence with that of the suffering part. To remedy this inconvenience, the author has submitted the diseased part to the prolonged use of refrigerants, by constantly keeping to the skin linens steeped in cold water, or wetted with a liquid that rapidly becomes volatile. In this way several of the before named surgeons have successfully treated extensive solutions of continuity, and considerable contusions that would have led to fear the developement of very violent inflammations. For two years that M. Berard was surgeon to the Hospital St. Antoine, the most of the patients, and they were many, affected with severe incised wounds and bruises, and several having their limbs crushed by accidents from steam engines, succeeded badly under this mode of treatment, when the parts treated by refrigerants were allowed, from neglect, to assume a higher temperature, and the relays of wetted cloths were not kept up, particularly during the night. It is easy to conceive the bad results brought on by the part passing from heat to cold and from cold to heat, graduated in the latter case but sudden in the former. He then had recourse to permanent irrigation with cold water, when the region of the body allowed its application; viz., in wounds of the limbs, which is the most common occurrence.

There is nothing more simple than the mechanism of this irrigation: a bucket is suspended over the part to be cooled: by means of glass syphons of small diameter the water is made to fall from the pail on the linen that covers the wound, and is imbibed so as to keep the diseased surface cool, allowing its caloric to escape by evaporation. A bit of oiled silk placed under the limb keeps the bed dry, and allows the water collected on it to run off into a vessel placed beside the bed. The pail must be supplied with water enough to last five or six hours, taking care to refill it before it is completely empty, otherwise the action of the syphon will be interrupted: the vacuum should be made in the long branch of the instrument to re-establish the current.

Whatever the season be, pump water is best for this use, as its temperature varies only a few degrees in the whole course of the year; a little camphorated spirits of wine may be added to it. The irrigation has been continued from six to fifteen days, as the case might have been. It is well not to use cold water to the very last, but to graduate its temperature by the addition of hot water for one or two days before discontinuing the irrigation altogether.

The first phenomena resulting from irrigation are diminished temperature of the skin and a painful sensation, probably due to the continual

abstraction of caloric, and which mostly lasts twenty-four hours. If there have been redness and swelling, these symptoms diminish rapidly, and at length disappear. The phenomena observed during the employment of the cold water, are remarkably simple. The temperature of the skin is constantly lowered; from being discoloured it assumes a reddish tint, due perhaps to the slowness of the circulation in the capillaries of the part. The epidermis, from being incessantly moistened, becomes soaked and thickened, and forms a layer sometimes uniform, sometimes irregular, of a dull white, and marking the colour of the subjacent tissues. The thickening of the epidermis is at times so considerable, as to lead to the belief that the volume of the whole of the affected part is augmented, but is easily distinguished from inflammatory swelling, whatever the wound may be.

Yet an inflammatory process goes on producing certain phenomena, which may be considered as effects or terminations of inflammation. First, the most advantageous is that of the adhesive inflammation, which is in no way impeded by the use of cold water; far from that, I have seen lacerated wounds heal by the first intention, though their surface was contused. The second phenomenon is that, from which the secretion of pus results; suppuration appears to be rather slower in its formation than in the ordinary treatment of wounds; but the pus is always what is termed *healthy*, a portion of it remains adherent to the surface of the wound, the remainder is carried away by the water without having recourse to any dressing. If the suppurating surfaces be examined, they are found to be formed of healthy granulations, firm, small, and red, as in the most simple wounds.

The circumstance most to be feared from the prolonged use of refrigerants is the mortification of the tissues, yet this occurrence is extremely rare, and is never observed even in the parts submitted to the irrigation, unless they be disorganized by the violence of the contusion. It occurs oftenest in the extremities of each limb, and twice the great toe has been affected by it. Yet it is doubtful whether the latter occurrence should be attributed to the contusion of the limb or to the irrigation. One thing is certain, however, that wounds treated by the usual means have been followed by gangrene of one or more toes, while similar wounds treated by irrigation have escaped. The following principles may be laid down: if in a limb affected with a complicated contusion, there be sufficient of the soft parts untouched to allow the circulation throughout the whole extent of the limb, gangrene is not to be feared; but if the thickness of the tissues uninjured by the contusion be inconsiderable, though even the extremity of the part be untouched, gangrene is not the less to be feared in that extremity. Cold water acts in such a case with too much energy, and under its sedative influence the circulation is retarded, perhaps even completely suspended, in the tissues which the contusion has spared, and life is extinguished in all that part that has lost its vascular connexions with the rest of the body.

CASE I.—A soldier of the 25th regiment was taken to the Hos-

pital St. Antoine, immediately on his receiving a wound in the hand while cleaning his gun after firing at the target. The whole contents of the gun, viz., the ball, ramrod, and worm passed through his hand. There was considerable hemorrhage, which was arrested by the introduction of charpie into the wound; at the ulnar side of the palm of the hand was a wound with lacerated edges, the neighbouring skin was burned, and the whole palm blackened by powder. On the back of the hand was a wound larger than that of the palm, its edges torn unequally, and turned outwards; there was comminuted fracture of the fourth metacarpal bone, the tendon of the extensor of the ring finger was denuded; in the bottom of the wound the metacarpal articulation of the same finger was widely open; a small quantity of blood flowed from the wounds: as yet there had been no tumefaction, but the pain was more intense than immediately after the accident.

The patient was put to bed, and the hand supported, pronated on a pillow of straw; charpie was introduced at both sides of the opening, and the hand and wrist were covered with compresses steeped in cold water, and renewed whenever they got warm. Next day the pain was still severe, with some swelling, but no febrile action. A little camphorated spirits of wine was added to the cold water, to increase its refrigerant quality; but during the night, from neglect of renewing the compresses regularly, they became quite hot several times. The next day the hand and wrist were red, swollen, and painful. From the sufferings of the patient during the night, it occurred to the surgeon to irrigate the part by the means before mentioned. This process was kept up for fourteen hours, and the next day the patient was much relieved; the pain diminished, the inflammatory symptoms and fever were nearly gone. For three days this plan was persevered in, without any return of the pain, heat, swelling, or general reaction; sleep calm, and the appetite good.

About the fifth day, pus was beginning to be formed on the surface of the wound, except one cut from the centre, about six lines long, which healed by the first intention.

The soft parts disorganized by the violence of the contusion, went away in shreds; vascular granulations of a good character covered both the surfaces; some bony exfoliations were easily extracted. At the end of three weeks the hand was in so promising a state that the irrigation was discontinued.

Nineteen days after the accident, and three days after discontinuing the irrigation, the patient got up and made use of the hand during the day, this was instantly followed by pain in the extremities of the little finger, the painful part became purple, and notwithstanding the use of emollient cataplasms and camphorated spirits, the two last phalanges came away sphacelated. However the cure of the hand proceeded well, and the cicatrices of it and the little finger were perfect in a month after, and in a few days the patient left the hospital, with the motions of the other fingers unimpaired, except that of the ring finger, which was shortened from the comminuted fracture of its metacarpal bone.

CASE. II.—A young man, a joiner, æt. 17, presented himself at the same hospital, with a tumour on the front of the right forearm, just above the annular ligament of the carpus. The tumour was indolent, hard, and elastic, without any change of colour in the skin; it was about the size of a small walnut, and had been increasing gradually for eight months. Leeches, iodine, and its preparations, had been tried without success.

M. Berard considered this as a synovial tumour, and at first treated it by mercurial inunction, and straps of adhesive plaster in the intervals of the frictions. At each attempt the tumour disappeared under the annular ligament, anterior to the carpus. He never felt the sensation of dry starch bruised between the fingers, or of grains of rice that are being rubbed together, a sensation, according to Dupuytren, indicating the presence of cartilaginous bodies lodged with the synovia in the cyst. But the patient complained of numbness at the extremity of the fourth finger. The patient was always attacked, after some hours' work, with a numbness in his fingers, and though the accidents attendant on incision of these tumours are to be feared, yet, from his intreaties, the operation was resolved on.

An incision of fourteen or fifteen lines long was made parallel to the external edge of the radius, and a little internal to the radial artery, and terminated at the superior edge of the anterior annular ligament of the carpus. The skin, sub-cutaneous cellular tissue, and the aponeurosis of the forearm, were cut through; the kyst being exposed the anterior half of its parietes were carried off by a cut of a curved scissars. There flowed out a transparent substance, about the consistence of the vitreous humour, and not much coloured. At the same moment the patient felt a sensation in the index finger, as if something was snatched from him. No accident troubled the operation.

A tent was introduced into the bottom of the wound, to cause suppuration, and prevent adhesion. The limb was then immediately submitted to continual irrigation. During the first twenty-four hours the patient experienced numbness, and twitches in the hand and forearm, but the following days they disappeared entirely; every thing went on well, without pain or swelling in the part operated on; suppuration set in in the kyst, and proceeded as in a simple wound.

At the end of six days the irrigation was discontinued, the part was then bathed every ten minutes with cold water, for five days more. Some simple dressing was next applied, the parietes of the kyst adhered, and the wound cicatrized completely. The motions of the hand and fingers are performed during the whole day without any inconvenience arising.

Thus an operation which has often produced death, or required amputation of the arm, and which in all cases has been followed by inflammation of the hand and forearm, so as to require the most energetic antiphlogistic treatment, has become successful from the after treatment by irrigation, and a speedy and safe cure obtained.

CASE III.—Refers to a patient *æt.* 55, on whom the high operation for the stone had been performed. This person had been castrated at the age of two years by a quack, for the cure of a double inguinal hernia. On cutting for the stone it was found to be caught in a fold of the bladder, and required some force to extract it; its weight was four ounces, its long axis two and a half inches, its diameter one inch nine lines. In order to guard against inflammation of the bladder, after so long and painful an operation, M. Berard had recourse to irrigation into the bladder; the bucket was used as before, the short arm of *one* syphon in the bucket, the other or long arm dropping into the bladder; the short arm of another syphon was next placed in the bladder, and the long arm left outside to carry off the superabundant liquid. The patient died thirty-six hours after the operation, but had not complained of pain, nor was there infiltration of urine, nor any mark of peritoneal inflammation, nor anormal appearance of the three great viscera, on a post mortem examination.

Though this case proved fatal, from *exhaustion of the nervous system*, yet M. Berard draws this conclusion, viz. that irrigation by cold water may be practised after the high operation for the stone, as a mode of preventing infiltration of urine, by diluting that fluid, and drawing it off as it collects in the bladder. Water may be used, (of blood heat,) so as to suit the latter indication.

CASE IV.—A young man, aged 19, was wounded in the left leg and foot, by the discharge of a gun (at fifteen paces) loaded with shot, (No. 6;) when he went home he covered the limb with emollient poultices. The same evening he was taken to the Hospital of St. Antoine, where the same treatment was continued till the next day, when the leg and foot were found to be swollen, red, and painful. The antero-inferior, and external surface of the leg and dorsum of the foot were penetrated by about forty round holes, with livid edges. A probe passed very deep into most of them, in some to the bone; in many the grains of shot could be detected by the probe having penetrated the aponeurosis. Irrigation by cold water was persevered in from the 26th February, to the 4th March, when the temperature was raised in the manner before related. From the time of applying the cold water, the heat and swelling diminished, the bright red changed to a violet colour. The pain disappeared, and the only thing complained of was the sensation of cold; suppuration set in, and with the discharge several grains of shot came away.

The day the irrigation was discontinued the patient got up contrary to orders, and began to walk on crutches. The day after there was some painful swelling; he still continued to walk, but the heat, swelling, and darting pains of the leg and foot compelled him to return to bed. These symptoms yielded, however, to emollient applications, and an elevated position of the leg; the wounds of the shot cicatrized, and the patient left hospital without feeling any further annoyance from walking. He returned some days after on account of an abscess on the external malleolus, which was opened, and exit

given to the pus, and a grain of shot. From that time the cure was perfect.

CASE V.—In the same hospital a soldier of the 8th Regiment was treated for a gun-shot wound, which penetrated the back of the hand, and came out through the palm, opposite the lower extremity of the third metacarpal bone. The hand was swollen, painful, and numb. There were no general symptoms nor hemorrhage; two small splinters of bone came from the wound. The patient was treated by the cold irrigation for seven days, at the end of which time the bad symptoms had disappeared; suppuration of a healthy character had set in, and simple dressing applied. On the eighth day the sloughs of the bruised parts became detached, but some stinging pains were felt in the evening.

9th day. The signs of inflammation are more marked, particularly in the palm of the hand; pulsating pains, rigors during the night; heat and loss of sleep; the wound in the palm of the hand had cicatrized. The symptoms induced the surgeon to make a large incision in the palm, through the aponeurosis, which allowed the discharge of very thick pus. The arm was bathed, and a seton passed through the hand, in order to keep the wound open, and to allow the exit of exfoliations of bone.

10th day. The swelling is more considerable; the darting pains continue; œdema of the back of the hand, and redness round the wrist, and to the bend of the elbow, from inflammation of the lymphatics; pain is intense and pulsating, but not extending beyond the hand; pulse rapid; sleep agitated. (Bath for the arm, and emollients to the hand and forearm.)

11th day. The inflammatory symptoms are less intense; there is less fever. The redness of the forearm has disappeared; the patient sleeps more calmly; the hand is still red and swollen; pus comes away through the incision on pressure; on drawing the seton, an angular portion of the ball, the size of a pea, came away.

12th day. Recurrence of symptoms similar to the former; the pulse frequent and fluctuating. An incision was made perpendicular to the muscles of the thumb, giving issue to pus mixed with blood. A probe detected a hard body, which proved to be a portion of a ball, half the size of a common bullet, which had lodged between the skin and muscles of the thumb. The following day another incision was made on the palm of the hand, giving exit to pus, which did not appear to communicate with the preceding abscess.

15th day. The seton was taken away, as the patient did not complain of pain, had no fever, and slept well. The removal of the seton seemed to diminish the signs of irritation, which had persisted after the opening of the abscess. It was two months before the patient left the hospital, from the wound remaining open by the coming away of portions of bone, and from the shortening of the middle finger, which always remained permanently extended.

The following observations are made on this case:—1st. A projectile of considerable volume had penetrated the back of the hand,

and the wound caused by it had become so narrowed as to lead to the supposition that the ball was much smaller than it really was.*

2nd. The ball had fractured two metacarpal bones, and had probably divided itself on them into two parts.

3rd. During eight days no accident had occurred to cause these foreign bodies to be suspected, but as soon as the irrigation of cold water was stopped, they caused a violent inflammation, abscess, &c. &c. Thus, during eight days, the antiphlogistic power of cold water has been sufficient to check the developement of the inflammatory phenomena which the nature of the wound, and the presence of foreign bodies, rendered inevitable.

CASE VI.—A woman, æt. 24, had her hand lacerated by the wheels of a cotton-machine, from which it could not be extricated until the moving power of the machine was taken away. The soft parts, comprising the skin, sub-cutaneous tissue, and some portions of the extensor tendons, were torn. The wound on the back of the hand was two inches in extent transversely, and six to eight lines vertically. All the thickness of the soft parts, comprising the tendon of the dorsal surface of the fourth finger, were torn from the metacarpal bone to the tip of that finger; the first phalanx was fractured, the latter intact; the palmar surface also was torn; the lacerated state of the soft parts prevented the state of the tendons of the fourth finger from being recognized.

On the palm of the hand was a transverse division, reaching from the second metacarpal bone to the little finger, involving in some places all the soft parts. Flexion and extension could not be performed by the fourth and fifth fingers. The pain in the hand and forearm was very great. The wound bled but little; pulse full and frequent. Irrigation of cold water, as before described, was persevered in four days with the usual good results, viz., no swelling nor redness; the pain very slight; heat of the hand natural; appetite good; constitutional symptoms favourable. The cold current was changed to tepid. Three days after suppuration set in; pulse rather frequent; headach and general heat complained of, but no redness or swelling; the irrigation was then discontinued, and cold water dressings substituted. The following days the patient complained of great pain, which was attended with redness of the face, headach, fever, disturbed sleep; cold-water dressings again applied. The day following the symptoms appeared improved. As the fingers were all strongly flexed, extension of them was effected by a palette under the hand. Ung. cer. dressing, and a bandage from the fingers to the bend of the arm. For a week after the same plan of treatment was continued, besides making flexion and extension every day with the fingers to allow the free gliding of their tendons, and to prevent their adhesion. After the use of some baths to the

* Guthrie has shown that the wound bears no proportion to the size of the ball.

arm she left the hospital, having the free motion of all her fingers except the fourth.

The result of the observations in this memoir may be summed up in the four following propositions :

1st. Cold water as a topical application should be made to act in a uniform continuous manner, and for a time long enough to obviate inflammatory reaction. This is accomplished by means of two or more capillary syphons. The application of linen steeped in cold water is more or less unsuccessful from the variations of temperature being more marked by the time lost in renewing the linens.

2nd. Continued irrigation by cold water is a heroic and infallible means of preventing and combating inflammation in cases of the most severe traumatic lesions, such as wounds from fire-arms, severe bruises, those resulting from dissection and carrying off a part of a cyst, situated in the middle of the tendons of the wrist, &c. &c., all which usually bring on the most violent inflammations.

3rd. Gangrene is the only accident to be feared from prolonged irrigation ; when it supervenes it is not in the wound itself, but in the part of the body that is beyond the wound. It supervenes when there is almost total disorganization of the soft parts of the circumference of the limb from contusion. It seems to be owing to the cold water opposing the free circulation of the blood in the portion of the soft parts that remain intact, and which serves as a bond of union between the extremity of the limb and the rest of the body.

4th. The author of the memoir has never tried this treatment after amputation ; but he thinks that it would prevent the generality of the accidents, local or otherwise, which such an operation too often brings on ; meantime he would promote union of the stump by the first intention, a circumstance so advantageous when successful.
—*Archives Generales*, January, 1835.

Spontaneous Gangrene of the Leg.—*Amputation before the Delimitation of the Gangrene*, by M. Amussat.—A woman, æt. 40, had suddenly experienced an icy coldness and very painful cramp, extending from the extremity of the left foot to the knee. She fell, and lost all consciousness. The skin became blueish, attended with tumultuous palpitations of the heart, absence of the pulse at the wrist, orthopnea, complete insensibility of the skin ; the left leg cold, and of a dull white ; the toes convulsively contracted ; excessive pains in the ham, which became more severe on the least motion. This woman had an affection of the heart for ten years.

The next day the diseased leg became burning hot, swollen as far as the knee, and covered with phlyctenæ. At the end of two days there was fever ; the face injected ; the ideas confused ; the leg painful and black as far as the calf, and livid red from that to the knee ; phlyctenæ larger ; the outside and back of the thigh, to seven or eight inches above the ham, presented an inflammatory blush. M. Amussat amputated at the lower part of the thigh, twisted four vessels, and united by the first intention. The operation seems to have been crowned with success. Besides the disorders produced by

gangrene, there was found in the popliteal artery, opposite the tibio-femoral articulation, a clot adhering to the internal membrane, red, consistent, and extending under the anterior tibial artery. A clot of the same nature, but more elongated, thinner, and less adherent, was found in that point of the vein that corresponded to the obliteration of the artery. The parietes of this vein were thickened, and had the appearance of an artery to the distance of an inch above the clot. At the same place the sciatic nerve was swollen and black, as was also the surrounding cellular tissue.—*Archives Generales*, January, 1835.

Anatomy-Bill.—It appears that, at a meeting of medical students in Edinburgh, held on Saturday, the 7th of February, 1835, where nearly 700 individuals attended, a long discussion ensued on the difficulty experienced (in the private schools, particularly of anatomy) in the northern metropolis, as to bodies for dissection. The 7th clause, especially, of the anatomy-bill, was blamed as the grand cause of the difficulties in question. This clause leaves it optional with the undertaker, or other person charged with the possession of a dead body, to give up the said body for money, for favour—or not to give it up at all, according to his pleasure or prejudice. The following petition to the Secretary of State, was therefore agreed to.

“That this meeting considers the present Anatomy-bill defective, inasmuch as it places no restraint on parochial authorities regarding the disposal of their unclaimed dead, and leaves them quite at liberty either to dispose of them as may best serve their own interest, or bury them if they choose to do so; and suggests that it should be made imperative on all parochial authorities, superintendants of hospitals, infirmaries, charities, &c. to forward a notice to the Inspector of Anatomy, of their district, whenever a dead body lies in their possession, under such circumstances as are pointed out by the Act.”

There was some discussion as to the propriety of soliciting Mr. Wakely to support the prayer of the petition. On a shew of hands, the great majority was in favour of the solicitation, and it was agreed to accordingly. Some gentlemen at the meeting asserted, that no difficulties were experienced in Dr. Monro's class, and that this meeting was almost entirely composed of the students of private schools. We regret to learn this state of things in the northern capital. It is said that up to the date of the meeting—when more than half the session had passed away, several hundred students had not had even an extremity for dissection! We fear there is little chance of redress at present. There is not much to be expected from *our* legislature at any time—and less now than ever. The political parties are now so nearly equipotent, that no ministry, whether Whig, Tory, or Radical can have any predominant weight in parliament to carry measures that may be, in the slightest degree, unpopular. A compulsory clause, such as is solicited in the foregoing address, would raise a cry against the minister that brought it in, and therefore we need hardly expect such an amendment to the Act at present.—*Medico-Chirurgical Review*, April, 1835.

EXPLANATION OF THE PLATE

Referred to in DOCTOR GREEN'S Paper, p. 231.

FIG. 1.

- a The Aneurism springing from the right side of the descending Aorta, and passing between the Œsophagus and Spine.
- b The right Bronchial Tube, somewhat flattened by the pressure of the Tumour.
- c The Œsophagus.
- d The Aorta.

FIG. 2.

- a The Aneurismal Sac pressing upon and flattening the left Bronchial Tube.
- b A deficiency of the upper and posterior part of the Sac, which was made up by part of the Spine.
- c Opening into the left Bronchial Tube from the Aneurismal Sac.
- d A portion of the Œsophagus.
- ee The Aorta.

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PART I.
ORIGINAL COMMUNICATIONS.

ART. XIV.—*Observations on Erythema Nodosum.* By TRAVERS R. BLACKLEY, A. B., Member of the Royal College of Surgeons in Ireland.

THIS is a disease of by no means frequent occurrence, inso-much, that many practitioners indeed do not recognize it when first presented to their view ; it is not peculiar either to *age* or *sex*,* nor have I known it to arise in any instance from infection, on the contrary, I have witnessed many cases where other children mixed with impunity with one so affected, without exhibiting the slightest symptoms of the complaint. So far as my experience goes it never proves fatal, though it reduces

* Dr. Bateman appears to be of an opposite opinion, as he says, “it seems to occur only in women.”—*Vide* his Synopsis of Cutaneous Diseases. Mr. Plumbe, however, very justly asserts the contrary.—See his Practical Treatise on Diseases of the Skin. Also Merriman in the edition of Underwood on Diseases of Children, edited by him.

the patient very considerably in strength and habit, and in adults sometimes assumes an alarming appearance on that account: it is uninfluenced by season, occurring in the depth of winter as frequently as the middle of summer, nor am I prepared to refer it to any peculiarity of habit or idiosyncrasy.* I coincide in opinion generally with Mr. Plumbe, in attributing this disease to some "*derangement of the secretions, and disordered state of those organs in which the process of chyli-fication is carried on,*" though I think the cause of it may be more *particularized*. The state of the tongue, however, and the pulse, the nature of the excretions, the proneness in children so affected to pull their lips, &c. &c., together with the good results which we observe to flow from the properly directed means adopted to remove intestinal irritation, all tend to prove, that this opinion is founded on just and rational foundations.

This complaint always appears in the first instance on the *legs*. I have never known an instance to the contrary; the parts first affected are the shins, where we observe large oval patches, "the long diameter of which," as described by Mr. Plumbe, "is parallel with the tibia;" this has been preceded by three or four days of fever of a mild type, at the end of which time the patient perhaps complains of sore legs, and on examining these we find the disease developed. A remarkable feature in this complaint is, that it is confined for the most part to the *fronts* of the legs; some spots may appear on the sides, especially over the fibula, but seldom or never on the calves, though the tendo Achillis is not always exempt: it will also exhibit itself on the arms, where the same peculiarity is to be observed, with this exception, that here the *fronts* of the arms are the *exempted* parts. In both cases, however, we may remark, that the eruption takes place over the muscles of *exten-*

* I have seen it affect a gentleman, and after an interval of ten or twelve years exhibit itself in two of his children in the course of twelve months—a girl aged seven, and boy aged four years; it did not appear in the other children of his family.

sion, while those of *flexion* are not affected. The eruption exhibits all the phenomena of inflammation, redness, heat, pain, and swelling; yet in each of these a certain peculiarity is found to exist; thus, in a large blotch, the redness is first of a bright colour, not so vivid as in erysipelas, nor shining. In the course of twenty-four hours it becomes darker, and the centre now begins to approach a purple hue, which it attains in from sixteen to twenty-four hours more: in the same additional period of time it assumes a light slate, and finally an ochre colour, after which at an indefinite time, the skin regains its natural appearance. The circumference of the blotch does not keep pace in its changes with the centre, but *follows* it; thus, when the latter is purple, the former is red, appearing like a ring of inflammation surrounding the centre, and when the centre is of a yellowish hue, the circumference becomes purple, which colour is there retained after the disease has terminated; whence the appearance is presented for several days of purple rings, where large blotches previously existed. I would here observe, that it is in the *large blotches* only that these *characteristic* changes are to be traced; in the small ones they are not generally to be remarked.

The sense of *heat* is not so great as we might expect from the inflammation, neither is the *pain* when in a recumbent posture, but both are increased on the patient assuming the erect position, when a heavy, bursting, and tingling sensation is conveyed to the inflamed parts of the leg, owing of course to the gravitation of the blood; even in the *horizontal* posture *pressure* on the inflamed spots causes pain, and should be avoided. The *swelling* in each tumour appears simultaneously throughout, but *subsides* from the centre, which does not at any time feel so hard as the circumference; thus in the stage of the disease where the *centre* is slate-coloured, it is also sometimes so *soft*, as, when compared with the *circumference*, which is harder

* How far may the *situation* of this disease be dependent on the existence of strong fasciæ under those parts where it usually appears?

and of a red colour, to give rise to apprehension (in those unacquainted with the disease) of *sloughing* from the centre. I have never seen an instance in this disease of the skin giving way; the termination of it is *invariably* by resolution. Its duration depends entirely on the means adopted to remove its exciting cause, which it is, therefore, necessary we should perfectly understand. Agreeing as I do generally with Mr. Plumbe, in his remark before quoted, I yet think, that this disease is more *particularly* referrible to the vitiated secretions of the *liver*: the dark and fetid character of the *fæces*, the deep colour of the urine, depositing a heavy sediment, the loaded tongue, and headach, with frequently a sensation of heaviness in the region of the liver, would point out that viscus as being the part most probably that is primarily affected; while the happy results which flow from the use of calomel in improving the tone of this organ, proves that such a conclusion is by no means unwarranted.

Calomel and jalap, as directed by Mr. Plumbe, is a most excellent purgative in this disease, and one that from frequent experience I can confidently recommend; at the same time I have seen greater advantage derived from preceding the above with alteratives of calomel combined with Dover's powder the night previous to administering the calomel and jalap. The Dover's powder is a most valuable adjunct, it retards the passage of the calomel, directs it more to the system, and not only allays gastric irritation, but causing a slight antiperistaltic motion, contributes to loosen any feculent matter adhering to the inner surface of the intestinal canal. The diet should be most particularly attended to; even when the case appears to be going on most prosperously, the least deviation from this rule will in all probability cause a fresh exacerbation of the disease within twenty-four hours; this I have frequently witnessed, consequently, never recommended any diet stronger than slops, until the tongue is perfectly clean, and that two or three days have passed without the appearance of any fresh spot.

I have already remarked, that the system suffers much from

an attack of this disorder, at the termination of it, therefore, we should administer tonics, and nutritive diet cautiously. Sulphate of quinine dissolved in a few drops of dilute sulphuric acid, and pretty largely diluted, does much in increasing the appetite and general strength, and improving the condition of the liver. After the disease has terminated, the skin which has been affected remains for several days of a blue mottled appearance, resembling bruises, and frequently gives off little branny scales; the swelling also remains for a considerable time, it is most remarkable over the tibiæ and fibulæ, and remains longer in those situations than over soft parts, giving to the bones an uneven appearance, and to the touch resembling a great number of nodes of various sizes over their surface, whence of course the origin of the term, *erythema nodosum*.

In illustration of the foregoing observations, I shall select the last case from my note book, which occurred in a child, and which is an excellent specimen of the disease, as exhibited at that time of life, in which by-the-by it is much less severe than in adults.

January 27th, 1835. W. B. aged four years, has appeared languid for a few days; hands and mouth hot; pulse quick; tongue loaded; headach: ordered a grain of calomel at bed-time, and a little rhubarb and magnesia in the morning.

28th. The bowels well opened twice; less heat of skin; at three o'clock this day complained of pain in his legs, which, on examination, exhibited well marked *erythema nodosum*: ordered low diet, and

R. Pulv. Jalapæ, gr. vi.

—— Zingiberis.

Subm. Hydr. ā ā gr. i.

Ft. pulvis cras mane sumend.

29th. Spirits very good; tongue cleaner; on the centre of the right tibia is a very large and prominent blotch, the extent of two half crowns of an oval form; on the fibula a small one; also a small one below the insertion of the tendo Achillis into the

muscles. On the left leg are several from the size of a silver penny to a shilling, chiefly on the tibia, but not confined to it; the calf of the leg however being quite exempt. No pain while lying down, but a painful sensation of fulness in the spots when standing: pulse ninety-six.

30th. The bowels were twice moved yesterday; the tongue is cleaner but still white, studded with minute red spots; pulse 100; slept well; the eruption fading, presenting in the large blotches the following appearances; a dark greyish blue spot in the centre, varying from the size of a silver penny to a sixpence, surrounded by a yellow circle from one to two lines in breadth; and this again surrounded by a broader red circle, which is lost in the surrounding skin: in the small patches these characteristic appearances are not well marked, but appear simply of a purple hue.

31st. Eruption fading, leaving a dark mottled appearance on the skin, and in some respect resembling a bruise; the hardness continues; some more recent red spots are scattered throughout. Pulse 100; tongue cleaning; no pain on standing; scarcely any fever, and spirits good.

Repet. pulv. cal. et jalapæ cras mane.

Feb. 1st. Several new spots have appeared on the legs, resembling the former ones, and like these painful on pressure; some small spots likewise on the thighs, blotches on the backs of the arms, and spots on the forearms. All this I attribute to the imprudence of giving him fish yesterday for his dinner, which was deemed by his mother innocuous, as he was free from fever, and complained much of hunger.

2nd. Condition similar to that of yesterday, but exhibiting more emaciation; unwilling to have his legs touched from fear of pain; tongue cleaner. Ordered,

Cal. gr. i. pulv. ipecacuanhæ comp. gr. iij. h. s. et pulv. jal. et cal. cras. mane.

3rd. Slept very well last night; the medicine operated freely; tongue much cleaner; pulse eighty; appetite increased;

is still apprehensive of any one touching his legs or arms; the eruption has faded very much on the latter, and the spots which have lately appeared there and on the legs have been much smaller than at first, and in some instances are of a circular form resembling the *roseola annulata*.

4th. Much as yesterday; the eruption fading, but a new spot scattered here and there.

Pulv. cal. et Doveri h. s., et cal. et jal. cras mane ut antea.

5th. Appetite and spirits good; tongue clean; pulse still quicker than natural; one small new spot has appeared on each of his arms and *one* leg, on the other a large erythematous blotch; the medicine has not yet operated; a good deal of thickening where the blotches existed.

6th. The powder did not operate yesterday, so according to orders he got some castor oil this morning; there is no new spot; the shins now present a blue mottled appearance; he has been much reduced, and is very weak.

8th. One new small spot has appeared on the left shin, the blue appearance has much faded, but thickening remains where the large blotches were situated; tongue quite clean. Ordered a grain of sulphate of quinine in solution twice a day.

13th. No recurrence of the disease, the purple hue has not entirely disappeared, neither has the swelling over the tibiæ; no pain on pressure.

20th. Swelling and purple colour nearly gone; health good.

A disease exists of which I have seen but few examples, which though totally differing from the preceding, might yet be confounded with it, resembling it in some of its general symptoms, but differing from it in its situation and cause, and the means indicated for its cure.

It commences by a little tumour under the skin of the back of the leg, generally the calf, feeling like a large grain of shot in that situation; without colour and without pain, unless when hardly pressed. Within about a fortnight it has increased to the size of a swan-drop, and has much the feel of an encysted tumour; the

skin now begins to assume a dusky red colour, and is painful on pressure; within three weeks from this time, if nothing has been done to relieve the complaint, the patient cannot stand on the leg without pain; the tumour is now much enlarged, and conveys a distinct feeling of fluctuation; if an incision be now made into it, the surgeon will be surprised, and perhaps not a little mortified to find, that much *blood*, but no *matter* flows, and the wound *may* put on a healthy appearance, and heal slowly as a simple ulcer, but leaving behind a considerable cicatrix. This, however, is not the treatment I would recommend, having seen it produce an ulcer of very long standing.

The plan I pursue is to apply leeches to the tumour in the evening; when they fall off, a poultice is applied into which the blood flows during the night. In the morning, the leg being washed, a compress of lint dipped in cold water or a solution of alum is laid on the tumour, over this a piece of oiled silk, and the entire leg from the foot to the knee carefully bandaged. In a couple of days, if the part becomes painful, the same treatment is to be adopted, and persevered in from time to time until the tumour subsides. At the same time I recommend cold bathing, if in summer, and a general tonic plan to be pursued, due attention being paid to the state of the bowels: during this time riding or carriage exercise may be ordered, and even gentle walking when the tumour is not painful on standing. In this manner I have successfully treated this disease, (at a time that high surgical authority had deemed the *incision* of the tumours to be necessary,) and with a comfort and liberty to the patient that could not be enjoyed, had the latter method been pursued. The tumours gradually lessen under this plan, and sometimes, not sooner than six weeks, is resolution effected, though even then a certain thickness remains in the skin. At this period a little camphorated mercurial ointment, rubbed into the part, will prove useful. The application of leeches frequently is troublesome, yet are they a slight inconvenience, compared to the pain of operation and long sub-

sequent confinement. This disease arises in persons of a cachectic habit; as I have only seen it in those of the better ranks, and in females, I have at times been inclined to attribute its remote cause to wearing tight garters; I have not seen it described, but as I have no doubt that its immediate cause is the rupture of a small blood vessel in the cellular substance under the skin, or a varicose vein producing subsequent inflammation, I would venture to apply to it the designation of *erythema hæmorrhagica*.

The following distinguishing traits then exist between the two diseases.

The *erythema nodosum* is ushered in by *febrile symptoms*; the appearance of the eruption is *sudden*. The *fronts* of the legs are the parts affected: the arms likewise may and do exhibit the disease, each blotch runs through its *inflammatory course*, if I may so call it, in two or three days, and depletion (I do not include bleeding) is indicated for its cure.

The *erythema hæmorrhagica*, (as I have ventured to designate the other disease,) is *not* preceded by febrile symptoms, it comes on *gradually*; it affects the *legs only* so far as I have seen, and the *calves* of these; none of the *characteristic* appearances of colour, as in the former disease, are exhibited; it may be weeks going through its course; the *tonic* plan is indicated for its removal; and it appears to be much more a *local* than a *constitutional* affection.

To conclude: the *former* disease seems to me to depend on an effusion of lymph;* the *latter* to a vein in a ruptured or varicose state causing topical inflammation.

* Some authors believe that *blood* is effused in *erythema nodosum*, and have therefore classed the disease with *purpura hæmorrhagica*. I do not think they are correct.

ART. XV.—*Observations on the Obstetric Extractor, the Instrument usually called the Midwifery Lever.* By JOHN BREEN, M. D., Honorary Fellow of the King and Queen's College of Physicians in Ireland, and formerly Assistant to the Dublin Lying-in Hospital.

[Read before the College of Physicians, April 21, 1835.]

BEING engaged in preparing for publication, a Dissertation on the Management of Difficult Parturition, a subject on which I laid some facts before the profession, in the Dublin Medical and Physical Essays, as far back as the year 1808, my opinions and experience on instrumental delivery, which are necessarily connected with the management of difficult parturition would not now be communicated, but would be reserved for future publicity, had not Dr. Churchill, at a late meeting in this Hall, read a valuable paper on Instrumental Delivery. He excluded, designedly, all consideration of the lever from his inquiries. It, therefore, appears to me, that following up his researches by some observations on the history, uses, and best mode of application of the instrument, which I call the obstetric extractor, would form not an useless supplement to his Essay, and be not uninteresting to those engaged in that branch of medical pursuit. For the adopting of this somewhat new term, I hope to offer, in another part of this paper, a more satisfactory reason than the mere love of introducing novel appellations.

Having mentioned the inquiries of my friend Dr. Churchill, which demonstrate that the opinions of all those most competent to form a correct judgment on such a subject, concur in the necessity of occasionally using instruments in obstetric practice, I have to regret that some of his statements are hastily drawn up. Thus in his Dublin references he says, that only two among Dr. Clarke's fourteen forceps cases proved fatal; when this distinguished practitioner states that he lost seven, or one half of the entire number. In referring to my paper, first pub-

lished in this city, in 1808, and afterwards in the Edinburgh Medical and Surgical Journal, in 1819, he gives only forty-four instrumental cases, when in fact sixty-two are mentioned. In the foreign references, the most remarkable, from the small number of instrumental cases, is the practice of Boer of Vienna. A careful examination of his book has given me a different result from that given by Dr. Churchill, his being only one instrumental case in 388, while my inquiries into Boer's work bring his practice nearly to coincide in the number of instrumental cases with our Dublin Lying-in Hospital. In summing up the practice at the Great Vienna Lying-in Hospital, from 1793 to 1800, both years inclusive, during which time 9,053 women were delivered, page 363 of his book, he states, that he used instruments once in almost every 200 cases (*inter ferme ducentos.*) Dr. Clarke's instrumental cases in our Dublin Hospital, were, from the commencement of 1787 to towards the end of 1793, as one in 157; mine from November, 1800, to July, 1806, as one in 188. Page 65 of his book, Boer states his instrumental cases, from September, 1789, to Sept., 1790, as seven in 958, or one in 136; from Sept., 1790, to the commencement of 1793, he used instruments once in every ninety-five cases.* In 1805 and 1806, he only used instruments three times in 2,034 cases, as he states at page 585 of his book, and lost but eight women out of the entire number. I give the results from Boer, but cannot account for the discrepancy of his practice, in 1805 and 1806, from all former years. In estimating the value of Dr. Churchill's facts, I look decidedly to those operators who are quite free from the suspicion of having used instruments unnecessarily; it is, therefore, on this account I dwell so much on Boer's statements.

I am the more induced to undertake the object of my present inquiry as to the value of the obstetric extractor now, and not de-

* See pages 131, 203, and 362, of his *Libri septem Naturalis Medicinæ Obstetriciæ, Viennæ, 1812.*

fer it to a future time, when I call to my recollection the aphorism of the father of medicine, that life is short, and opportunity fleeting; also as I flatter myself I can so condense my remarks, as not to be tedious to such of my auditory as are not obstetricians.

That the Chamberlens, father and sons, who lived in the latter part of the seventeenth century, were the inventors of the midwifery forceps and veetis, is now pretty certain; that their successful exertions to discover means compatible with the safety of both mother and child, obtained for them the rank of eminent obstetricians, and also one of its agreeable consequences, wealth, is proved by their acquisition of landed property. It is ascertained that one of the family, Dr. Peter, purchased the estate of Woodham, Mortimer Hall, near Maldon in Essex, prior to the year 1683, which was sold by another of the family in 1715.

A very few sentences, in addition, on what can be now known of this family, may not be inappropriate on this occasion. In the year 1665, Dr. Paul Chamberlen, the father, published his *Midwife's Guide*, which contains no particular pretensions. In the year 1670, Dr. Hugh Chamberlen, one of the sons, gave a translation of Mauriceau's *Midwifery*, and stated, in the preface,* that his father, brothers, and himself, have possessed by God's blessing, though none else in Europe, that he knows a way to deliver a woman when the head, on account of some difficulty, cannot pass. During this year one of the sons went to Paris, as it is conjectured, either for the purpose of selling his secret, or with an intention of practising in that city, and turning to his emolument the possession of an important auxiliary to assist females, in difficult parturition, with safety to parent and offspring. Unfortunately for the success of his plans, he first tried his method on a patient in whose case Mauriceau pronounced the pelvis to be deformed, and that she could only be delivered by the Cesarean operation. The woman died un-

* See Bland's paper in *Medical Communications*, vol. ii. p. 413. London, 1790.

delivered, and her death was doubtless accelerated by the violence used in the trials of Chamberlen.

This attempt to bring a full-grown child through a deformed pelvis, without diminishing its volume, will excite the less surprise when we call to our recollection, that it was then a very general opinion among physiologists, that the ligaments of the pelvic cavity relaxed during labour, and allowed the bones to separate, in order to facilitate the exit of the foetus, an opinion which Harvey, the great discoverer of the circulation, held, and which Mauriceau first successfully combated. Disappointed in Paris, Chamberlen went to Amsterdam, where he sold his secret to Roonhuisen, a surgeon practising in that city. Prior to the recent discovery of some private papers of Chamberlen's, and of his instruments in a false floor, in a closet at Mortimer Hall, which were given by the present owner to Mr. Casserly, and by him bestowed on the Medico-Chirurgical Society of London; it was a mooted point, whether their secret was the forceps, or the lever, or both. It was the more general opinion, that the Chamberlens used the double lever or forceps, and that the Dutch surgeon, determining to make the most of his purchase, learned to use one branch alone, by which contrivance he found the secret could be more easily concealed. But the engravings of the instruments found as just stated, and published by Dr. Rigby in the *Edinburgh Medical and Surgical Journal* for 1833, page 366, prove, that the Chamberlens probably also used the single blade, and were aware that it occasionally succeeded. Roonhuisen, the first purchaser, made the celebrated anatomist Ruysch a participator in the mode of using the instrument, and it continued for above sixty years to be sold by the descendants of Roonhuisen, for a valuable consideration to each succeeding purchaser, under the engagement of not communicating the method. In the year 1753, De Vischer, and Van der Pol, two medical men, who then resided in Holland, purchased on the usual terms; and reconciled it to themselves to break the conditions of their contract, and communicate the

knowledge of the instrument through the medium of the press. Their publication was in the Dutch language, and it chiefly became known in these islands, through an account of it prefixed to Monsieur Prevelle's translation of Smellie's *Treatise on Midwifery* into French. Vander Pol settled at Canterbury in England, and assumed the name of Dawkins, but probably from his ignorance of the English language, did little to spread the knowledge of the mode of using the obstetric lever.

Van Swieten, a native of Holland, a resident for some years at the university of Leyden, and afterwards Professor at Vienna, treats of this instrument in the fourth volume of his *Commentaries on the Aphorisms of Boerhave*, published in 1764, and considers the revealing of the secret of the midwifery lever, as a benefit conferred on the human race.

In the year 1774, Camper published a paper, in the *Memoirs of the Royal Academy of Surgery*, at Paris, on *Labourious Labour*, in which he fully investigated the history, and gave his opinion on the mode of action of the midwifery lever, in facilitating delivery. The eminence of the writer, and the character of the publication, immediately called increased attention to this instrument. This Essay of Camper appeared twenty years after the discovery by De Vischer and Vander Poll, ten years after the publication of Van Swieten, and nearly about twenty years from the period of the retirement, from teaching and practice, of Smellie. I regard this individual as the father of British midwifery, and concur in opinion with Dr. Bland, that had he been sufficiently early in possession of what I may call the Dutch secret, his observant and intelligent mind would have investigated calmly its general utility, and demonstrated its relative value, as compared with the forceps. The opinion of Van Swieten, and the publication of Camper, from the high character of the men, necessarily brought the value of the instrument, as an auxiliary in difficult parturition, before that portion of the community who were best capable of judging of its utility. The learned commenta-

tor on Boerhave, though he produced testimony which could not be called in question as to the value of the instrument, did not succeed in introducing it to notice in this country, as it seems that prior to Camper's Essay, no very great attention was bestowed on the subject in Great Britain.

During these years, William Hunter, who practised and taught midwifery in London, from his high character, would appear to be the person from whom we would most anxiously look for an opinion on the midwifery lever. It is well known that he was a most implicit believer in the resources of the powers of nature, and probably, as an eminent physiologist, he was induced to look down upon the more mechanical genius of his early instructor Smellie, with whom he was domesticated as a pupil on his first arrival in London, and considering him as too fond of interfering with the forceps, was unwilling to sanction the introduction of a new instrument. In his published works there is nothing on my present subject, and his manuscript lectures on Midwifery, of which I know numerous copies exist, have never fallen in my way. By comparing Van Swieten and Camper, I may almost say by their joint testimonies, the possessors of the Roonhuy-sian lever, in selling their secret and handing the instrument to the purchaser, combined with whatever more diffuse instructions were given, the short sentences *potentia agit in os occipitis*, and the nearly as brief, though less intelligible Dutch jargon "*de benglestant ni de nok*." In discussing the meaning of these Dutch words, Camper says, no one understood them, of course he means no person uninitiated, and that he cannot give an idea of their meaning, and that they appear to him something mysterious.* Through the kindness of an eminent linguist of this city, I think I have arrived at a probable explanation of the Dutch words, which I hope to turn to an useful purpose, when I come to investigate the best mode of applying the obstetric extractor.

* See Camper's paper, p. 246, vol. xv. of the Transactions of the Royal Parisian Academy of Surgery. Paris, 1774.

Not to occupy the time of the meeting, with entering into a detail of the opinions of teachers and practitioners, from the middle until towards the latter part of the eighteenth century, I will now copy what Doctor Denman wrote on this point. He published the first edition of his *Treatise on Midwifery*, in the year 1781, seven years after Camper's *Essay* appeared. It will not be assuming too much, to take for granted, that this very intelligent writer and practitioner, gave a fair view of the opinions of his more eminent contemporaries, and, therefore, that most of the celebrated obstetricians in London, were in the habit of preferring the *veetis* to the forceps at the period he wrote.

The following words contain Denman's sentiments on the relative value of the lever, as compared with the forceps, as an auxiliary to assist the female in difficult parturition.

He says, "from this statement it may be presumed, that the *veetis*, prudently used, is in every case an equally safe and efficacious instrument with the forceps, and a better adapted instrument, in many cases which occur in practice. It is with this persuasion that several teachers of the art of midwifery in London never use the forceps, or speak of them in their lectures, while others, to whose judgment I owe much respect, continue to use the forceps, and think I have advanced more than experience will justify in favour of the *veetis*."*

In the next page of Denman's book, he follows up the subject by saying, "I know several gentlemen of eminence in the early part of their lives accustomed to use the forceps, who discovering by accident or trial, that they were able to afford every assistance with a single blade, or the *veetis*; but I never knew an example of any person who having been accustomed to the *veetis* relinquished its use, and resorted to the forceps." With respect to the more favourable part of Dr. Denman's opinion, which, be it observed, though he lived for many years

* See Denman, vol. ii. p. 127. London, 1801.

after, he did not alter, on the utility of what he calls, the midwifery veetis, I nearly concur. After briefly attempting to account for his opinions not having carried the weight I think they merit, I will proceed shortly to explain what appears to me the safest and best mode of applying this instrument. I only once had an opportunity of trying it in the Lying-in Hospital, while I was assistant physician to that institution, but I have since repeatedly and successfully used the same instrument in private practice. There are in this room two gentlemen who have seen me successfully operate with the obstetric extractor, and a professional engagement has detained a third, Dr. M'Keavor, who has also been in consultation with me with the same result.

I now proceed to endeavour to explain the reasons why Denman's opinions on this point did not, as I think they ought, obtain more universal concurrence. About this period, at all events at a distance of time not exceeding two years, Baudelocque published in Paris, and De Herbinaux at Brussels, the latter a favourer of the lever, the former of the forceps. The Gallican writer really gave, as it were, a new form to the science of midwifery. He explained the mechanism of parturition better than any of his predecessors, and combining an important observation, or perhaps I might better call it a discovery, of his predecessor in teaching, Solayers De Renhae, on this point, with a great deal of theory and confident assertion, his opinions obtained an influence much beyond their deserts.

In Baudelocque's writings there is an attempt at too much precision in describing the passage of the child through the pelvis. He accounts for the disturbing powers that frequently interfere with this process, as if they were all well understood, and their causes demonstrated, while, from their variety and uncertainty, they give rise to numerous deviations. In his 673rd paragraph, he says, it is necessary that the head should follow a determined course. In developing his notions of this course, and describing the various turns and inflections the head makes

in performing it, the whole progress is laid down as if every difficulty could be accurately calculated, and every possible deviation satisfactorily explained. From his anxiety to make his theories appear the result of established facts, and to lead his readers to believe, that the entire efficient causes of parturition were familiar to his mind, that no part of obstetric mechanism was unexplained in his work, and by endeavouring to pass his system as perfect, I believe, he stopped the progress of improvement, so that from these combined causes, I am inclined to consider him as the great misleader of youth.

The discovery of De Renhae consisted in ascertaining, that when the face of the child was towards the pubis, it sometimes turned into the hollow of the sacrum : the importance of this observation will again be referred to.

In London, Dr. Osborne combated the opinion of Dr. Denman, in a very well written book, which attracted much attention, as it included an exposition of the danger and inutility of the operation of the division of the symphysis pubis, then in some repute at Paris ; to this publication the latter made no direct reply. Dr. Bland answered Dr. Osborne, but his book was written in such a captious spirit of special pleading, and seemed to display so much greater anxiety to conquer his adversary, than to elucidate truth, that it did not make much impression on the profession. At Edinburgh, Professor Young and the first Hamilton were rather favourers of the forceps as compared with the lever. In Dublin, during the period now under consideration, the only published evidence I find is the Essay of Mr. William Dease, the earliest professor of surgery to the Irish College of Surgeons, and the father of Professor Richard Dease, whom many of my auditory must recollect. The first Mr. Dease, as far as I can ascertain, was the originator of the proposal for using the midwifery lever solely as an extractor. I know that a gentleman, Mr. Keogh of Meathstreet, who, for a great many years, enjoyed a very considerable share of midwifery practice, and left a large fortune to his

descendants, used the lever successfully and extensively. He informed me, that he was called into consultation, on one occasion, with the gentleman who for many years held the first station in obstetric practice in this city, in the case of the patient who is mentioned by Dr. Denman, in the third volume of the *Medical and Physical Journal*, as an Irish lady of rank, where the circumstances were such, as that Dr. Savage of London, in consultation with Dr. Denman, agreed on the propriety of inducing premature labour. Mr. Keogh informed me, that in the instance in which he was called in, he delivered successfully with the lever. This account, not very long since, was confirmed to me by the brother-in-law of the lady, one of his Majesty's counsel at law. Mr. Keogh lived to a very advanced age, and retired from practice some time before his death, in the full enjoyment of his faculties; he conversed freely with me, as to his mode of using the lever, and it corresponded with the published account of Mr. Dease. I make no doubt but the latter communicated with the former (who was his senior in the profession) on the subject. In consequence of the influence of Baudelocque's name, whose opinions seem to have swayed the French School of Midwifery, the forceps became the favourite obstetric instrument with that nation, and Dr. Osborne's authority seems to have had more weight in guiding the opinions of English teachers, and practitioners of this art, than Dr. Denman's, or Dr. Bland's. It appears from this statement, as well as from Dr. Churchill's researches, that the forceps had an almost universal preference, with the leading obstetricians of Europe, and taking Dr. Dewees' evidence as to America, we may join the practitioners of the United States to those of the old world. There were always some obstetricians who held the midwifery lever in high estimation, and used it with dexterity and success during this period: I have just now mentioned the name of the late Mr. Keogh of this city. In the 18th volume of Duncan's *Medical Commentaries*, Dr. Hamilton, the Professor of Midwifery in the University of Edin-

burgh, published a valuable Essay on the Midwifery Lever, in which he refers to Dease's instrument, supports his opinion on the propriety of using it as an extractor, and highly disapproves under any circumstances of using it as a lever of the first class.

Within the last few years testimonies in its favour have arisen ; Dr. Blundel of London considers it a safer instrument in the hands of the general practitioner than the forceps, and refers to Mr. Gaitskill's paper on the lever, published in the 20th volume of the London Medical Repository, in 1823. In that paper it is stated, that the writer used this instrument successfully for many years. A writer in Johnson's Medico-Chirurgical Review, for July, 1821, also holds, that the lever is equally as valuable to the obstetrician as the forceps. Mr. Burns of Glasgow, though he considers the forceps the more generally preferable mechanical aid, when midwifery instruments are requisite, does not call in question the use of the lever when judiciously employed. Latterly, even in Paris, where Baudelocque was almost considered infallible, Velpeau writes as follows : " thus my object is not to substitute the lever in place of the forceps. I have simply wished to make it appear, that with us (the French accoucheurs) the mechanism of the lever has not been well understood, that without being indispensable, its employment in some circumstances is not to be despised, that its application is *too simple, too harmless*, in comparison with that of the forceps, not to have recourse to it, when the head presents at the perinæal strait, and does not appear to be detained, but by the want of action of the organs of the woman ; I may even add, that its introduction will often have the great advantage of renewing uterine contraction, as well as that of the abdominal muscles, and by these means accelerate, indirectly at least, the termination of labour, *without exposing either mother or child to any danger*. I am moreover happy to state, that in nearly the entire of this view, M. Desormeaux concurs."*

* See Velpeau Traite Elementaire De l'Art des Accouchemens, &c. Paris, 1829, paragraph 1,093.

I have been in the habit of using the obstetric extractor for twenty-nine years, not as a lever of the first class, but as an extractor in the way mentioned by Dease. The instrument I have always used is that usually called Lowder's lever. When the hinge with which it is provided, for the purpose of being more conveniently carried in the pocket, is fastened by the pivot, this extractor is twelve inches in length. The handle, which is steel on its inner part, and partly ebony on its outer, is five and a half inches long. The blade before being curved was rather more than seven and a half inches. This, I believe, gives as great a degree of curvature as is consistent with the facility of introduction, and affords considerable extracting power. It is what artists call fenestrated at the extremity of the blade, or it has an oval aperture there, for the purpose of giving a greater number of points of contact with little pressure. The instrument has its greatest breadth, one inch three quarters, at the widest part of this oval. The description need not be more minute, as surgical instrument makers are sufficiently familiar with the construction of Lowder's lever. I consider the term lever particularly objectionable, as we are all so familiar with the mode of action of that of the first class, that the very name gives a hint to the operator, should he encounter much difficulty, to make the pelvis of the mother a fulcrum, and thus run the risk of doing much injury. I need not (particularly considering this essay as supplemental to Dr. Churchill's researches) attempt to demonstrate, that without the assistance of instruments in obstetric practice, both mother and child would sometimes perish. Though I hold that the life of the former is never to be put in serious danger, in making an attempt to save the latter; yet I doubt that any one will hesitate to afford assent to the ideas of Dr. Davis, the Professor of Midwifery in the London University. I select him particularly, as on another occasion he has spoken rather slightly of the over anxiety of some of the continental practitioners to save the child. Dr. Davis's expressions are; "the child's life however should

not be hastily yielded up, (he means by using the perforator,) nor until nature and art shall have exerted their utmost and united resources; until the most powerful efforts of the one, and the best devised expedients of the other, shall have been fairly and deliberately exerted without effect.”*

To justify the use of the obstetric extractor, it is necessary that the pelvis be not materially deformed, that the os uteri be fully dilated, or very nearly so, and that the os externum be in a yielding state. I have proved in a former dissertation, that unless accidental occurrences, such as rupture of the uterus, puerperal convulsions, hæmorrhage, or other rare contingencies take place, we may wait with safety thirty hours for the condition of the parts above described, and use appropriate means during the interval to promote such a condition. I would here observe, that though the safety of delaying instrumental aid for thirty hours be proved as a general proposition, it by no means follows, that the obstetrician should always put off affording extraordinary aid for that period.

I cannot better illustrate the propriety of occasionally interfering by extraordinary aid, than by referring to Dr. Every Kennedy's *Observations on Obstetric Auscultation*, page 242, where a case is recorded in which probably “five minutes delay” of the use of the forceps, would have caused the extinction of life in the child; such a case affords a most valuable example of the utility of auscultation in saving the life of a being, endowed with the first great gift of a benevolent providence, the germ of accountable agency. It is the more gratifying to record it, as the child was alive and healthy four years after its birth. This measure of thirty hours time affords to the junior practitioner, as it were, a period of safety, during which he may pause as to his ultimate measures.

Prior to describing what I consider the best method of using the instrument under consideration, I will premise a very

* See Davis, vol. i. p. 206.

few sentences as to the mechanism of parturition where the head presents.

To obtain a correct notion of the fundamental principle of this mechanism, I would recommend the student of obstetric medicine to provide himself with a pair of callipers. By applying this instrument to the longest diameter of the child's head, from the upper part of the occiput to the symphysis of the chin, he will find this diameter, unlike that of a circle, to be confined nearly as it were to two mathematical points, as the slightest change of the callipers gives a diminished diameter. The same variation in the next longest diameter will be equally apparent, by holding one limb of the callipers on the same point of the occiput, and removing the other to the lower part of the forehead. Thus every change from the longest gives a diminished scale of measurement, until the shortest is embraced. It is equally capable of demonstration by measurement, that the human pelvis is a cavity of unequal dimensions, and different diameters, and that for the easy termination of labour, it is necessary that the largest diameter of the head should not be locked, as it were, in one of the small diameters of the pelvis. The hand of the obstetrician, unaided by any instrument, has been successfully used to remedy such an occurrence, by changing the direction of the head, as appears from statements by Baudelocque,* John Clarke,† Dewees,‡ Ashwell, and our own Professor Montgomery.§ The hand thus facilitating delivery, as proved from these authorities, shews us what very slight impediments retard delivery for a length of time, and every experienced obstetrician knows, that this delay may give rise to serious danger. It must be kept in mind, that though

* See Heath's Translation of Baudelocque, paragraph 1,282.

† John Clarke's paper in Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. ii. p. 229.

‡ Dewees, paragraph 651.

§ Montgomery's paper, Dublin Journal of Medical and Chemical Science, vol. vi. pages 234, 235.

we have quite sufficient authority for the occasional success of the manual operation without instrumental aid, the cases of failure in such an attempt, which must be numerous, have not been recorded. Madame Lachapelle, in the first volume of her *Midwifery*, page 81, says: "for my part I have sometimes succeeded in changing the position of the face or the parietal, often also I have foundered in my efforts." She also quotes the opinion of Schweighauser, in which she appears fully to concur. His words are: "I have not been able as yet to satisfy myself of the facility which some authors say they find in changing the position of the head into a more favourable one, before having recourse to the application of the forceps." The writer of these observations, though he has never met with such striking cases as those of Dewees, Ashwell, and of his friend Professor Montgomery, is satisfied he has sometimes shortened the duration of labour, by changing the direction of the head in the manner before referred to. He is equally willing to acknowledge that failure has often attended what appeared to be similar trials.

In the most frequent vertex presentation, where the labour has made some progress, and where the os uteri is dilated entirely, or nearly so, the posterior fontanelle is found to the left of the pelvis, near the left acetabulum, the sagittal suture traversing the pelvis obliquely, the anterior fontanelle generally higher than the posterior, in the majority of instances corresponding to the right sacro-iliac syncondrosis, shewing the chin to be bent on the chest. In this case the right parietal bone is the part of the foetal cranium which is lower than any other. The head is propelled downwards with a rotatory motion from left to right, and generally expelled before the base of the occipital bone is moved completely round to the arch of the pubis. This last statement is not quite in agreement with the more general description of authors, but I am satisfied future and attentive observations will confirm Professor Naegle's views on this point. In this most favourable presentation the uterine

action is occasionally for hours exerted in vain from causes which we are frequently unable to account for. Much delay may excite fears for the safety of the child, and lay the foundation of a tendency to inflammation in some of the soft structures of the mother, indicated by some or several of the following symptoms: increased frequency and fulness of pulse; tongue loaded in its centre; secretion of urine diminished, and becoming higher in colour, sometimes requiring to be drawn off by the catheter; countenance assuming an anxious aspect; stomach irritable; general increase of restlessness. This state of things, not an imaginary fiction, but one which I have witnessed, allows me an opportunity of describing how the obstetric extractor should be applied under such circumstances. The instrument can be passed with the greatest ease, as the patient lies on her left side, in the direction of the hollow of the sacrum, more to the right of the pelvis, than to the left, it is to be carried forward under the right ischium, and cautiously passed until the extremity of the instrument reaches the base of the cranium, somewhere near, but beyond the mastoid process of the temporal bone. Were I giving a lecture to mere tyros, I should be under the necessity of laying down the process by which the relative direction of the occiput to the pelvis might be ascertained. Writing for practitioners, I take for granted, that they possess this very necessary preliminary information. Yet it may be useful to recommend the operator before introducing the extractor, for fear of mistake, to reconsider the view he has taken of the position of the foetal head, on the accuracy of which his success must depend. Should he have formed his judgment before the cranium has escaped from the cervix uteri, the contraction of this organ on the easily compressible anterior fontanelle, will frequently lead the hasty or less experienced to mistake this for the posterior. This contraction affords an explanation of the hitherto prevailing error, as to the great frequency of the occurrence of the first position of Baudelocque, particularly as compared with his fourth. The influence of this

sphincter-like action is well illustrated by the certainty with which we sometimes ascertain the anterior fontanelle, when the membranes, rigid and unbroken, contain a large quantity of liquor amnii, the interposed fluid taking off the pressure from the cranial bones. Should he, as it were, wish to check his opinion, founded on the situation of one of the principal fontanelles, by finding the direction of the helix of the ear, which is always towards the occiput, let him recollect, that if, in examining, his finger change the direction of the helix towards the forehead, the head is always sufficiently pressed to the pubis to retain that appendage of the cranium in the irregular situation which the search for its direction may have placed it in. When called on after violent labour has lasted many hours, and that there is considerable cranial tumour, this precaution will be found useful, and as far as I know, it, as well as the *cause* of the common mistake of the great frequency of the first position, is now first communicated to the profession.

The operator should now gently use some force to ascertain if he have a purchase. He must then during a pain draw downwards, and in a direction from left to right, to bring the occiput from the left of the pelvis towards the symphysis pubis. By this mode of action the head can generally be brought to commence the distending of the perinæum, and the remainder of the process be left to nature. This power of *readily* withdrawing the extractor before the final expulsion of the head, is a most incalculable advantage; I am satisfied the injury done to the perinæum, when the forceps are used, and which is so much dreaded by all experienced obstetricians, is universally produced by the rapidity of the expulsion of the head after the chin departs from the chest, and the difficulty, or often impossibility, of withdrawing the forceps with sufficient quickness to allow our undivided attention to be applied to the care of the perinæum. On this subject, the opinion of Madame Lachapelle, whose opportunities of observation were unequalled by any writer of the present day, is so much to the point, that I feel pleased in having her authority to support my views. She says, vol. i.

p. 46. "In the last period of labour it (the forceps) will determine almost inevitably this rupture, (that of the perinæum,) if care be not taken to withdraw it some moments before the complete termination." In this position of the head I have sometimes found, that the extractor, applied as I have just pointed out, did not seem to act, as it were, favourably on the part on which it was placed, and it has struck me, that the expelling power had forced the right parietal bone too low, in proportion to the remainder of the head, and that the power of the uterus still acting on this part was acting in vain. Whether my view be correct or not, I have certainly succeeded in such cases, by removing the extractor to the opposite side, and with a very slight degree of force applied to the head, giving that part a direction downwards, and from left to right, effected the delivery. When the head begins to distend the perinæum, I always withdraw the extractor and leave the expulsion to nature, by which it is generally accomplished; very rarely in such a case the pains again become unavailing, and require the renewed application of external aid. The head is now so low, that a very slight extrinsic force added to the uterine action, however slight this may be, will disengage it. I never met an instance where the instrument passed obliquely across the bottom of the pelvis, the handle to the left, the other extremity towards the opposite ischium, in which a very slight exertion of power, directed to move the forehead from the hollow of the sacrum, did not disengage the head. The instrument in this case need scarcely be passed beyond the reach of the fingers, while at the same time its introduction offers no difficulty, and is unattended with pain to the mother; the only precaution to be kept in mind is to avoid injuring the eye of the infant, by allowing the extremity of the blade to reach it. In a similar case Dr. Lowder advises the lever to be applied nearly parallel with the raphe of the perinæum, and the extremity of the blade to be passed over the chin; from the very slight force required in this case, I doubt not its safety, but I cannot speak from experience. Dr. Den-

man alludes to this mode of applying the vectis, but like myself, had no experience of its safety. He does not mention the name of the proposer, and it was but lately, by having procured the *Historia Literaria et Critica Forcipum et Vectium*, of Mulder, printed at Leyden in 1794, that I was aware that Lowder made such a proposal. The German writer attended Lowder's lectures in London, and I cannot find any trace of the latter having published his opinions. From my experience in the use of the obstetric extractor, I am satisfied, that the fact mentioned by Dr. Denman, vol. ii. p. 132, of the facility with which some practitioners operate with the midwifery lever, and the quickness with which they effect the delivery, must apply to this particular manner of using it, and that this mode is only applicable when the head begins to distend the perinæum. Dr. Denman writes as follows: "some gentlemen have by frequent practice acquired such wonderful dexterity in the use of the vectis, as to finish the operation of extracting the head of a child with one single action of the instrument." This explanation of the way of applying the extractor in the most common case of the heads passing through the pelvis, by keeping in mind, that in every instance, with one exception, the power is to be directed so as to bring the occiput towards the arch of the pubis, at the same time drawing downwards, will give a general and correct idea of the mode in which it is to be used in other presentations of that part. The one exception is where the occiput is to the sacrum, and the face to the pubis, and that the head has advanced so far in this position, and is, as it were, so jammed, that it would require too much violence to change the direction it has taken. I have never used the extractor in this position, though it is one in which some writers recommend the instrument.

Though I have described the mode of using the obstetric extractor in the position of the cranium that occurs most frequently, and with which, therefore, we are most familiar, and which is now universally called by writers the first of Baude-

locque, I do not believe it to be the position where its use is most frequently demanded. On the contrary, I am convinced, it is in the fourth of Baudelocque, the third of Naeglé, and the German school, where the anterior fontanelle, originally more directed to the pubis, has receded from the front of the pelvis, and that the sagittal suture is nearly parallel to the lateral or transverse diameter of that part; this change of position, first pointed out by Solayers De Renhae, appears to be much more frequent than was generally thought, before the publication of Professor Naegle of Heidelberg. Should this movement of the anterior part of the cranium from the pubis to towards the sacrum have gone on slowly, the further change is often so much retarded as to require extraordinary assistance, or to endanger the safety of either mother or child, or both, by the delay. The obstetrician familiar with the mechanism of parturition, can readily apply the directions for the management of the most common cranial position, to this by no means unfrequent situation of the foetal head in labour.

It now merely remains, in order to finish what I have proposed in this paper, to offer a few observations on the success of the Dutch practitioners in the use of the lever. At Amsterdam, after Roonhuysen had obtained celebrity by the use of this instrument, no man was authorized to practise midwifery, in fact he was prohibited by the municipal authorities from doing so, unless he possessed the secret of this individual; moreover, for many years, the magistracy employed either one or two surgeons, at a salary, who were bound to attend poor women in labour in all bad cases. A register was kept by them and returned to the magistrates; and from Camper's paper, p. 239, before frequently referred to, it appears by the returns, that in the city of Amsterdam, from the year 1741 to the year 1765, the average annual number of births was 7,000; the average of births calling for extraordinary assistance in each year, forty: thus giving a proportion of one in 175, approaching nearly to the average number of cases that required like assis-

tance in the Dublin Lying-in Hospital, during the time I held an official situation in that institution. Camper's paper was published in 1774. Dr. Bland of London was the next publisher on what I may call obstetric statistics; my paper first appeared in 1808, and though, as appears from Dr. Churchill's researches, many have since contributed facts to this branch, the three individuals above alluded to have priority in this field of investigation.

The mortality neither of parent nor child was remarkable at Amsterdam, as appears by these returns; in truth, we may allow the Dutch to be too shrewd a people to pay men for exercising a branch of an art which was found destructive to human life.

To fulfil what I set out with undertaking, it is now necessary, that I attempt an explanation of the Dutch jargon, as Camper calls it, *de bengelstant ni de nok*. For this I am indebted to an eminent linguist of this city, Mr. Abelthausen. *Bengelstant* must imply a cant name for the vectis of Roonhuyssen: it is a compound word signifying both stick and pole, and by some kind of mystical meaning, was applied to the instrument delivered to the purchaser of the secret; *ni de nok*, without doing much violence to language, may be understood below the neck. The instructions given to the initiated may be thus rendered, *potentia agit in os occipitis*, apply your instrument to the occiput; *bengelstant ni de nok*, pass it towards the neck or base of that bone; which directions were given, because it was then supposed, that the head always passed through the pelvis without changing the direction of its diameters, and that the occiput, through the entire progress of labour, corresponded with the symphysis pubis. Baudelocque, who was much better acquainted with the mechanism of parturition than De Herbinaux or the Dutch practitioners of the earlier part of the eighteenth century, in his arguments against the use of the lever, proved that it could not act exactly in the manner they supposed. Correct in this part of his argument, and overlooking strong facts, he pushed his conclusion too far, and endeavoured to infer its

almost general inapplicability. In the endeavour to get the instrument below the neck, it always necessarily passed to one or other descending branch of the pubis, in consequence of the attempts made to get it near the base of the occiput. Towards the left branch, if the head were in the first or most common position, and towards the right if in the next most general way in which it cleared the female pelvis. The power of the instrument was then so great, acting as a lever of the first class, having one of the descending rami of the pubis as a fulcrum, and it moved the head in such a manner, and not contrary to the direction which it ought naturally to take in clearing the pelvic passage, that the pressure was not in general continued sufficiently long to injure the soft parts of the mother; the instrument being almost universally either to the left or right of the urethra.

I fear I have trespassed on the patience of my auditory, and, therefore, shall say nothing of the application of the extractor when the head is above the brim of the pelvis, as I have never succeeded in its use in such a case, and I believe in above thirty years' practice, not more than three or four individuals have come in my way, where there was reasonable grounds for using it. Had I been aware of Dr. Hamilton's opinions, which I acknowledge I ought to have been, as I read his Essay in the Medical Commentaries, when a student at Edinburgh, though I did not re-peruse it until I was preparing this paper, or of Mr. Gaitskill's experience on this point, I would have tried more perseveringly, and with better hope of succeeding. Since I read Mr. Gaitskill's Essay, one opportunity has occurred to me of adopting his suggestion of using the extractor, in the way I believe he was the first to recommend, after lessening the volume of the head, and I can report most favourably of this mode of applying that instrument. As the subject on which I have communicated my opinions on the present occasion, only makes a part of the more extensive one of the general management of difficult parturition, I have avoided in my present attempt the collateral branches which

might be introduced, such as the comparative value of the midwifery forceps, as compared with the obstetric extractor. Apprehensive that I have already trespassed too much on the time of this assembly, I shall, therefore, reserve for future opportunity the various points in obstetric practice closely connected with my present subject.

ART. XVI.—*Observations on Typhoid Pneumonia, with Cases.*

By ALFRED HUDSON, M. B. T. C. D.

SEVERAL varieties of pneumonia have been described by the older writers under the names of typhoid, malignant, gangrenous, erysipelatous, gastric or bilious, scorbutic, &c. &c. differing but little from each other, and forming an union of a local inflammation with constitutional symptoms of a low type, which we may designate by the general term, typhoid or asthenic pneumonia.

This may comprehend the above, or as many other varieties having such a pathological cause, as a state of the blood, a gastritis, &c., but I cannot, *therefore*, see the force of Dr. Mackintosh's* objection "to the adjunct typhoid, as expressing erroneous ideas of the pathological condition of the body." The best mode of naming a disease undoubtedly is by its pathological cause, when that is certain and can be arrived at; but as such is not the case here, our next best mode is to do it from the assemblage of symptoms most uniformly found, and which best distinguish it from the sthenic form of the disease: these are all of a low or typhoid type. They are, in addition to the more common symptoms of pneumonia, which in these cases will generally be present in an aggravated degree, great prostration; feeble, rapid pulse, sometimes intermitting; head-ach; delirium; great thirst, and occasionally vomiting of a green fluid; partial and cold sweats; diarrhoea; black dry tongue in the

* Practice of Physic, vol. i. p. 420.

worst cases, with offensive breath ; thin and sanious expectoration, or sometimes a mixture of pure frothy blood, &c. &c.

Great variety of opinion regarding its pathology will be found among the authors who have written on it. Dr. Good* says, "it may be easiest explained by describing it as an epidemic synochus, or typhus, occurring in such situations, at such seasons of the year, or in such a temperament of the atmosphere, as has a tendency to excite inflammation of the lungs ;" a little after, however, he sanctions the theory that it is a *pulmonic erysipelas*.† Huxham viewed it as a scorbutic inflammation, and has given probably one of the very best descriptions of the worst forms of the disease. Dr. Mackintosh‡ and Dr. Williams seem to regard congestion as the essential cause. "It may be almost a question, says Dr. Williams,§ whether in these cases the local disease in the lungs is not rather *a congestion of blood in an altered state than an inflammation*, and it is very commonly the sequel rather than the cause of the fever." Another theory is, that the typhoid character of the disease depends on the complication of pneumonia with gastritis : this opinion has to a certain extent been advocated by Dr. Stokes,|| and a number of cases, in which the complication existed, are given by Andral,¶ who looks on it as the cause of the typhoid symptoms. The predisposing and exciting causes assigned are : habitual abuse of ardent spirits ; long continued exposure to cold, especially under the influence of fatigue ; intoxication, or other depressing cause ; the coexistence of other

* Study of Medicine, vol. ii. See also on Erysipelatous Pneumonia, Bursarius's Institutes, vol. v. p. 142.

† On Fevers, pp. 186 and 210.

‡ Loc. cit.

§ Cyclopædia of Practical Medicine, Art. *Pneumonia*.

|| Clinical Lecture, London Medical Journal, vol. iii. p. 553.

¶ Clinique Medicale, vol. i. See especially Cases of Pneumonia, pp. 18, 19, 22, 26, 36, 37, &c.

diseases, as typhus, erysipelas, or scurvy; a prevailing epidemic, &c. &c.

As regards the treatment, the experience of all observers seems to prove, that the ordinary treatment of pneumonia is inadmissible. Dr. Williams says, "the impropriety of the free use of blood-letting is obvious from its effects." These effects are thus graphically described by Huxham.* "It was surprising how much the pulse and strength of the patient sunk after bleeding in such cases: with no small concern and astonishment I several times observed a vast anxiety, fainting, cold sweat, and a thready intermitting pulse very soon succeed it; though at the very beginning of the fever, and when the pulse seemed strong and throbbing before." Laennec, Chomel, and others, give similar testimony to the danger of free bleeding, and the necessity for stimulants; and the experience of Dr. Stokes is confirmatory of that of the other writers. In the clinical lecture above referred to, he states, that some patients will not bear bleeding at all; that he has often seen persons faint on losing five ounces of blood; that the tartar emetic treatment is inadmissible, and that calomel and opium should be preferred, while at the same time an early recourse to stimulants, as polygala and carbonate of ammonia, and even wine, is necessary.

I am induced to offer a few remarks on a subject so common, and considered so completely *settled* as pneumonia, from a persuasion, that in one respect the above form of the disease deserves a degree of notice beyond what it has generally received. The *physical signs* are occasionally perfectly latent, frequently partially so; and from a careful observation of a very considerable number of cases, this latency has seemed to me to bear a certain relation to the symptoms, or rather the pathology, which would lead to a three-fold division into

1. Cases in which the typhoid type was connected with a

* On Fevers, p. 211.

congestion of the lung, independent of inflammation ; the effect of which was to cause the signs of the latter to become latent either wholly or in part.

2nd. Cases in which this latency co-existed with gastritis, the typhoid type depending probably on the latter.

3rd. Cases of typhoid pneumonia with more intense gastritis, and without modification of signs.

I am indebted to the kindness of Dr. Stokes, for permission to make use of the reports which I furnished of a number of cases which occurred in the Meath Hospital, in the early part of 1833, when I acted as his clinical clerk. The remainder of the cases fell under my own care in the Navan Fever Hospital during a recent epidemic of typhoid pneumonia. I shall endeavour to condense those selected for this paper into the briefest possible space.

CASE I.—*Typhoid Pneumonia without Gastritis ; Signs of Inflammation, at first perfectly latent, afterwards nearly so ; Hepatization ; Death.*

John Butler, æt. 21, a carpenter, was admitted into the Meath Hospital, March 18, 1833. States, that on the 14th he drank to excess, and while intoxicated sat for some time exposed to rain : on the evening of the 15th he had violent rigour ; on the 16th he felt great weakness, and disinclination for food or drink, except cold water or whey, and these he vomited almost as soon as swallowed. On the day before admission he was seized with stitch in the right side, and a slight cough.

18th. His countenance is sunken and sallow, and expressive of pain ; surface cold ; great prostration of strength ; he complains of sharp pain extending from the right mamma outwards, with tenderness on pressure ; short dry cough ; head-ach ; great tenderness of epigastrium ; desire for cold drinks, and complete loss of appetite : pulse 105, small and feeble ; respiration thirty-four ; tongue furred ; bowels regular.

Warmth was applied to the feet, and he took two ounces of

wine in negus ; in about an hour his chest was examined ; percussion gave a clear sound everywhere except over the upper part of the right side, where there was a shade of dulness scarcely appreciable. The respiratory murmur was feeble over the entire right side, and *nearly entirely null in the supero-posterior portion* ; puerile respiration over the left. *No trace of crepitus could be discovered anywhere.*

He was bled to fifteen ounces, and ordered

Calomelanos gr. iv., opii gr. $\frac{1}{4}$ 3tiis horis.

Hirudines xx. epigastrio vesperi.

19th. Less prostration ; head-ach, thirst, and epigastric tenderness much relieved ; raved last night : over the scapula, *where respiration was yesterday null, a pretty distinct crepitus is now heard.* No other alteration in the signs.

Rep. calomel. c. opio. App. hirudines xxiv. axillæ.

20th. Last night was again delirious ; less prostration ; no headach or thirst ; pulse ninety. Marked dulness over the scapula, with bronchial respiration and bronchophony ; above the mamma marked dulness, and a very faint crepitus.

Rep. pilulæ. Applic. vesicatorium lateri.

21st. Delirium last night ; increased thirst, and tenderness of epigastrium ; tongue loaded ; pulse ninety-six. No change whatever in the signs.

Hirud. xii. epigastrio. Enema emolliens.

22nd. Much worse ; dozing, with muttering delirium ; great prostration ; ileo-cæcal region exquisitely tender on pressure ; pulse 130, and feeble ; general dulness of the side, with bronchial respiration and bronchophony.

Hirudines xii. ileo. Haust. aperiens.

23rd. Feeble respiration in the lowest portion of the side ; bronchial respiration and dulness everywhere else ; symptoms the same as yesterday.

Applicentur Hirudines x. lateri dextro et postea cucurbitulæ sine ferro.

Vesicatorium amplum lateri.

R. Calomel. gr. v. opii. gr. ss. 3tiis horis.

Hab. mistura polygolaca carbonat. ammoniæ.

Hab. vini ℥iv.

24th. Comatose, with loud tracheal rattle. Died early on the following morning.

The body was examined five hours after by Dr. Stokes. The whole of the right lung adhered by a layer of recent lymph to the opposite pleura; on a longitudinal section of it being made, it was found that the upper two-thirds was in the state of grey softening, with a mixture of red scattered throughout. Of the remaining third, part was in the stage of red hepatization, and a small portion at the base merely congested; most of the left lung was healthy, but a small portion inferiorly engorged and softened; the pleuræ here adhering. The surface of the heart *presented a number of small patches of ecchymosis*, resembling the spots of purpura: its substance was soft and flabby. *The stomach and intestines presented no trace of inflammation.*

I would call the above a case of *essential* typhoid pneumonia, characterized by the following particulars: its mode of access; the general symptoms, as, headach, delirium, remarkable prostration, pseudo gastrite, &c.; the insidious, latent march of the solidification, without almost any foregoing crepitus; the complete intractibility, at least by ordinary treatment, however actively and judiciously pursued; the state of the blood observed after death.

I have met with a similar appearance under the serous membrane of the heart, in two other kinds of cases. 1. In a dissection I made of a case of low diffuse cellular inflammation, in a woman named Masterson, which is published by Dr. Graves, in the sixteenth Number of the Dublin Journal. 2. In cholera, while an assistant to Dr. Mackintosh in the hos-

pital of Drummond-street, Edinburgh. I met with this appearance in at least fifty dissections of those who died in or soon after the collapse. It appears to me indicative of an altered state of the blood, and taken with other circumstances in the foregoing, and in the following case, is, I think, strongly corroborative of the conjecture of Dr. Williams, that "the pneumonic affection is really more a passive congestion, arising from an extremely atonic state of the vascular system, *with probably an altered state of the blood*, than a true inflammation."

CASE II.—*Typhoid Pneumonia, complicated with Bronchitis ; rapid latent Progress of the Disease ; Death.*

Mary Malone, æt. 35, married, five months pregnant, was admitted into the Navan Fever Hospital, March 2nd, 1835, labouring under violent headach, cough, dyspnœa, and acute pain in the left side. She states, that she has had a trifling catarrh for the last three weeks, that two evenings since, (Feb. 28th,) she was seized with violent rigour, without any known cause, which continued the entire night ; it was followed by a sharp pain under the left mamma, feverishness, thirst, and vomiting.

On admission, her pulse was 140, and small ; respiration high and laborious, forty-eight in the minute ; cough almost incessant ; short and stifled with copious *catarrhal* expectoration ; her enunciation panting and interrupted ; face dingy, contracted, and expressive of pain and anxiety ; decubitus on left side and back ; tongue clean ; bowels confined since the attack.

On percussion the chest gave a clear sound, with the exception of the postero-inferior third of the left side, where it was dull ; respiration puerile and mixed with bronchitic rales in the entire right and upper third of left side ; over the lower portion of this scapula it was *feeble and muffled, and inferiorly entirely null ; no trace of crepitus over any part of the side ; no resonance of voice*. I bled her to twelve ounces, and gave

her a scruple of calomel, also ordered a diaphoretic pectoral mixture, and directed the side to be cupped, and six ounces of blood taken away.

The blood drawn from the arm presented in the course of a few minutes a peculiarly fine buff; 10 P. M. I found her apparently much relieved by the cupping. On examination of the chest, the following remarkable changes were found; dulness on percussion, and nullity of respiration inferiorly as before, but from the angle half way up the dorsum of the scapula, and for the same extent in the lateral region, there is feeble *bronchial respiration, and bronchophonia*, mixed with a peculiarly harsh crackling frottement; this is loudest half way up the scapula, and decreases in its intensity till it is lost in the inferior portion; *no crepitus*.

Diagnosis; pleuritis with effusion.

I ordered ʒii. of mercurial ointment to be rubbed in every twelve hours.

R. Calomel; pulv. Doveri ā ā gr. iij. 4tis horis.

3rd. The patient passed a restless and almost sleepless night, suffering much from occasional attacks of severe dyspnoea; her breathing is now easier, and she has much less pain; respiration forty-four; pulse 150 to 160, varying in frequency, and extremely poor; she complains of cold and shivering; countenance extremely depressed and anxious; decubitus on sides and back indifferently; bowels twice opened; cough frequent, with copious expectoration of two distinct kinds, catarrhal and viscid tenacious sputa, tinged of an uniform bright red, with a mixture of spots of pure blood. Signs: dulness extends to the upper third of the side, with corresponding diminution of respiration, which is nearly null up to a short way below the spine of the scapula; here and over the spine it is bronchial with bronchophony; the latter is heard as low as the middle of the scapula, and there terminates abruptly; no frottement, *or scarcely* any to be heard, and no trace of crepitus. I felt no hesitation in setting down these signs to *increase of*

effusion, but having again *cupped* the side to seven ounces, I repeated my examination, and found that in the course of half an hour the following change had taken place. "From the sub-spinal fossa posteriorly, and from the axilla laterally, down to within the inferior third, there was the most intensely loud bronchial respiration and bronchophony, with the harsh uneven frottement before noticed. No crepitus whatever."

Contr. pulveres. Hab. mixt. Polygalæ c. carbonat. ammoniæ et tinct. scillæ.

4th. Soon after midnight she complained to the nurse of some pain in the belly, and immediately after abortion followed of a foetus, which shewed signs of life for several minutes. No hæmorrhage occurred, and she slept well in the latter part of the night; face less anxious, but depressed; pulse 120, soft and much fuller; respiration twenty-four, and easy; voice steady and full; bowels confined; expectoration much changed, the red viscid patches floating in reddish serum, approaching in fact to the prune juice sputa of Andral; no ptyalism.

Signs: dulness continues over the inferior third, but *over the scapula, and laterally, it is changed for a tympanitic muffled clearness, (bruit de pot failli.)* In this region there is the most intense bronchial respiration and resonance, with *occasionally a few bubbles of crepitus*; frottement less intense, but still very plain, and distinguishable from the crepitus. At the base of the lung there is now heard a very feeble murmur of respiration, with frottement.

R. Ol. ricini; ol. terebinth; tinct. sennæ ā ā ʒii.

℞. statim sumend. Contr. cetera.

10 P. M. A great change has taken place in the signs since this morning; the entire side, to the very base, presents on percussion a clearness not at all inferior to the other, but of a tympanitic character; over the spine and supra-spinous fossa there is pure bronchial respirations; below it is mixed with a loud and sharp crepitus, which is particularly distinct laterally and

inferiorly. The resonance of voice is most intense and diffused. Cough very troublesome; sputa copious, thin, and sanious, deeper in colour than before; an occasional itching of the gums, but no ptyalism; bowels gently opened by draught.

5th. I was unable to see the patient till three P. M., but I learned that after passing a good night she seemed to be improved, and going on well till 12, noon, when she awoke from a short sleep with great increase of dyspnœa, and lividity of the face, and shortly became comatose. On my visit I found her evidently dying; I could only observe, that the same tympanic clearness on percussion existed, *fully to as great a degree, and of the same kind, as in a case of pneumo-thorax*: the tracheal rattle obscured all other signs.

I ordered her wine and a camphor bolus every second hour, but she continued to sink, and died at half-past nine P. M.

Autopsy nine Hours after Death.—*There was no air or fluid formed in the pleura*; the left lung was universally adherent on its lateral and posterior aspects, by a thin tenacious layer of semi-organized lymph; on removing this the lung presented a dark purple, mottled appearance: it was very heavy and perfectly solid throughout, with the exception of a small part of the anterior and posterior inferior portions. On making a central division from above downwards, it presented red hepatization in the uppermost lobule; of the remainder of the lobules, (which were well defined by the thickened septa,) some were entirely grey, the most a motley mixture of grey and red: these were granular and much softened. The inferior portion, for nearly three inches from its margin, presented a mixture of red softening with simple engorgement, most of this part of the lung being still crepitous: the bronchi were highly injected, and lined throughout with dark red mucus; with the exception of bronchitis and some congestion, the other lung was healthy; the quantity of fluid blood that flowed from the

hepatized surfaces was uncommon.* Circumstances rendered it impracticable to push the examination farther.

I have given the above case at great length, because I regard it as one of the best marked instances of this type of disease I have met with; best illustrating the rapid and latent march of the congestive pneumonia, and the embarrassment which may be felt in forming a diagnosis, even after a careful examination. I have already confessed the error I fell into, of supposing that effusion was the cause of the absence of all respiratory phenomena. The second cupping, on the day after admission, by relieving the congested lung, and removing in part the load that oppressed and paralyzed its action, first led me to the diagnosis which dissection proved to be the correct one. That no effusion had existed, is proved I think by the *suddenness* of this change, and further by the *even* and *regular* deposition of the layer of lymph. I shall hereafter recur to the two most interesting features in this case; the late appearance of the *signs* and *peculiar* symptoms of pneumonia, and the occurrence of *morbid clearness on percussion without air in the pleura*. In the treatment of the case, I have to regret, that the deceptive improvement in the symptoms made me rest satisfied with the measures I had adopted, and prevented me having recourse to stimulants in time.† I shall next give a brief outline of a case resembling the former in some respects, but milder, and strictly belonging to the second class, in which the pneumonic attack was most insidious and latent.

CASE III.—Daniel Hay, æt. 21, a tailor, of temperate habits, was admitted into the Navan Fever Hospital, April 6, 1835. Illness of four days' duration, commenced with violent and long-continued rigor, headach, vomiting of bile, loss of ap-

* Forbes's Laennec, 4th Edition, p. 196.

† Dr. Mackintosh truly observes of this disease, that remission of the complaint sometimes take place, and it is too much the custom at such time to omit necessary remedies. A knowledge of the *signs* ought however to be sufficient to keep one from this mistake.—*Prac. Phys.* vol. i. p. 420.

petite, thirst, &c. When admitted, he was labouring under extreme prostration, with a dingy yellow depressed face ; constant short, stifled, dry cough ; pain in the head and in the epigastrium, (with tenderness on pressure,) and lower part of the right side ; respiration hurried ; pulse very rapid and compressible ; tongue foul. By a careful examination of his chest, I could detect no dulness, and only a slight feebleness of respiration in the inferior portion of the right side ; no crepitus ; the cough I therefore set down, along with the more decided symptoms of gastritis, as belonging to this cause, and ordered him to have ten leeches applied to the epigastrium, and to take the simple diaphoretic mixture of the hospital, consisting of equal parts of camphor mixture, and liq. ammon. acet.

7th. Presented all the typhoid symptoms of the day before, but coughed more freely, and expectorated viscid, tenacious, dark brown sputa, (he assured me for the first time.) An examination of the chest now presented soreness of the entire right side on pressure or percussion ; very evident but not extreme dulness, most marked over superior half ; respiration feeble over the whole side, bronchial under the clavicle, and over supra-spinous fossa, with great resonance of voice ; not a trace of crepitus over any part of the side, even during cough or a forced respiration.

In addition to gastritis, we had now evidences of pneumonia passing into the second stage in the upper portion of the right lung. I ordered twelve leeches to be applied to the right axilla, and a scruple of calomel to be taken immediately, and repeated after eight hours.

8th. Was much relieved by the leeches, which bled very freely ; has since had very little cough or expectoration ; the latter has no tinge ; pulse down to sixty, and fuller ; respiration thirty-six ; tongue moist ; thirst relieved ; bowels not opened since the 6th, and the calomel has produced no griping ; no change whatever in the signs ; slight mercurial foetor of the breath.

Appr. emp. vesicat. lateri dextro.

R. Decocti polygalæ ; mistur. camphor. ā ā ℥iv.

Carbonat. ammoniæ ℥i.

———— sodæ ℥ij. ℥. Sr. ℥i. 3tiis horis.

9th. Passed a good night ; perspired slightly for a couple of hours ; urine clear and pale ; bowels twice moved ; symptoms and signs the same as yesterday ; mouth a little sore.

Contr. mistura.

10th. Symptoms all improved : dulness seems rather less in the upper part of the side, and is decidedly so inferiorly ; the *bronchial respiration in the former portion is mixed with a fine crepitus*, apparently distant, and heard at the close of the inspiration : it is very distinct anteriorly, and in the axilla ; less so in the supra-spinous fossa : slight ptyalism.

11th. Not much change ; crepitus very plainly heard in the axilla ; less so in the other situations ; respiration still decidedly bronchial, with considerable dulness under the clavicle ; mouth improving. As matters seemed to be at a stand in the lung, while all gastric symptoms had for some time subsided, I resolved to endeavour to hasten the resolution of the pulmonary congestion by tartar emetic, which Dr. Stokes* has observed to do this in cases where mercury had previously failed.

R. Tartar. emet. gr. vi.

Tinct. opii acet. gtt. xx.

Aquæ ℥vi.

℥. Sr. ℥i. 2da q. q. horâ.

12th. He took four grains, but could go no farther, as it produced violent vomiting. He is every way improved ; his countenance clear and lively ; no cough, soreness of the chest, or any other symptom of affection of the chest, and he complains of hunger. The signs have equally improved ; the side is much clearer on percussion, and the respiratory murmur louder throughout, with much less bronchial respiration superiorly.

* See his paper on Pericarditis, Dublin Journal, vol. iv.

Decoct. sarsap. ℥i. Liq. potassæ ℥ii.

℥. Sr. cyathum ter die.

14th. Convalescent: no signs of disease remaining in the side.

I regard the above as a case of typhoid pneumonia, affecting chiefly the central portions of the lung, but which would, from its rapid though insidious progress after admission, and the state of constitution of the patient, have become in a short time as extensive and intractable a case as any of the others, but for the early and active treatment. The most striking effects were produced on the 11th, by adopting Dr. Stokes's valuable suggestion.

CASE IV.—*Rapid and general Congestion of the Lung, and Gastritis; Absence of Signs of the first Stage; rapid Progress to Solidification and Gangrene; Death.*

Thomas Cowley, æt. 32, a labourer, habitually intemperate, was admitted into the Meath Hospital, March 13th, 1833. States, that on the 9th he fell into the canal while intoxicated, and after sitting for some time in his wet clothes, was seized with shivering, followed next morning by febrile symptoms, with frequent short cough, dyspnœa, and pain in the right side. On the 11th he applied at a dispensary for relief, and was blistered, and took purgative medicine without benefit. I did not see him till the evening of his admission, but Mr. King Ellison, under whose immediate care he was placed, kindly favoured me with the following report of the symptoms and signs which were then present.

“On admission,” says Mr. Ellison, “he presented great prostration of strength, inability to lie on the left side; his pulse 126, and sharp; respiration hurried and laborious, forty-eight in the minute; he complains of dull, distressing pain under the right breast, dyspnœa, short frequent cough, with expectoration of viscid, mahogany-coloured sputa; he has great thirst, with loss of appetite; hot dry skin; some tenderness of epigastrium; furred tongue; costive bowels; and high-coloured urine.

“Signs : well-marked dulness, with *total absence of respiration* in the anterior and lateral portions of this side. *The remainder of the side and the left side gave a clear sound on percussion, and puerile respiration.*”

V. S. ad. ℥xviii. Cucurb. cruent. lateri dextro. Enema purgans statim.

Hab. Calomel. gr. iv. opii gr. $\frac{1}{4}$. 3tiis horis.

Half-past five, P. M. Is much relieved from pain in the side ; pulse 130 ; respiration hurried, and abdominal ; face much flushed ; skin hot and dry ; bowels not opened. *The dulness on percussion now occupies the entire right side ;* anteriorly no sound can be heard by the stethoscope, except an occasional sybilant rale under the clavicle, while laterally, and over the entire lung posteriorly, there is bronchial respiration, without the least mixture of crepitus.

14th. Passed a very restless night, dozing at intervals, but raving in his sleep ; he is dull and heavy, but answers collectedly ; pulse 136, sharp, but very compressible ; respiration very much hurried ; tongue dry and brown ; skin hot ; great prostration of strength ; his breath has a slight degree of foetor. The expectoration is very copious, and changed in character, consisting of bloody serum, with shreddy patches, ‘apparently mucous,’ floating in it.

Signs : there is very feeble bronchial respiration anteriorly, and some mucous rale at some distance below the clavicle ; bronchial respiration is loud over the entire side posteriorly.

Applicentur hirudines xx. axillæ. Vesicatorium lateri.

℞. Decocti polygalæ ℥viii.

Carbonat. ammoniæ ℥i.

℥. Sumr. ℥ss. omni horâ.

Hab. Vini Rubri ℥iv.

I visited him again at half-past five, P. M., in company with Mr. Ellison ; he was heavy and stupid, but on being aroused, said he felt better ; pulse 134, and very compressible ;

respirations fifty; expectoration of *sanious fluid* very copious; the breath had become most abominably foetid since morning, and the nurse remarked, that the foetor was much increased after coughing: it was not mercurial, but evidently gangrenous. The sputa were inodorous, but the appearance so similar to a case of gangrene I had witnessed a little before in Sir Patrick Dun's Hospital, that I expressed my fear of this result to Mr. Ellison. There was no change in the signs, except *an irregular mucous rale half way down the side anteriorly*, (just under the border of the pectoral muscle.)

15th. Patient lies on the right side; breathing and pulse rapid; tongue clean and livid; countenance sunken, but, as Dr. Stokes remarked, wanting the leaden hue of gangrene of the lung; wandered during the night, but is now collected; there is no mercurial action, and *the foetor of yesterday evening has entirely disappeared*; expectoration as before.

Signs: phenomena in the upper lobe the same, but over the infero-posterior portion there is either tracheal or cavernous respiration, and large mucous rale at the root of the lung. Dr. Stokes was of opinion, that though the foetor was not present, or the face of gangrene, that the stethoscopic phenomena left no doubt of the existence of a cavity, which, from the expectoration, &c. it might be argued was a gangrenous one.

Omittr. calomel.

Repr. mist. polygalæ. Hab. vini ℥viii.

16th. The patient passed a very restless night; his prostration is now so great, that merely turning in bed produces a great change in his pulse; expectoration as before. When lying on his left side, cavernous respiration and gurgling are heard at the root of the right lung: *on his sitting up the latter sign disappears*; other signs as before. He gradually sunk, and died at five P. M.

Autopsy sixteen Hours after Death—in the presence of Dr. Stokes. The right lung adhered by soft shreddy dark co-

loured lymph to the costal and diaphragmatic pleura ; its lobes were similarly adherent, so that it formed one solid extremely heavy mass. The removal of it from the thorax produced the rupture of a gangrenous cavity in its anterior portion, below the border of the pectoralis major muscle, and external to the right mamma, the parietes of which were formed anteriorly and externally by the pleura, superiorly by the lower surface of the superior lobe, and inferiorly by a soft dark and filamentous sphacelated mass, which rested on the pleura above the diaphragm. The cavity was about the size of a closed fist, and contained a quantity of the same kind of sanious fluid which had been expectorated. The remainder of the lung was one uniform mass of grey hepatization ; the left lung was healthy. The stomach presented intense stellated redness of the lesser curvature through its entire extent, with softening and thickening of the mucous membrane.

The above is a case deserving of attention for many reasons ; it exhibits clearly the close connexion between typhoid pneumonia and passive congestion, and also the liability which this form of stagnation of blood possesses in common with others to run into gangrene ; the latency of the ordinary signs of pneumonia ; and the extraordinary rapidity with which the states of congestion and solidification may successively supervene. Mr. Ellison's report of the state of the lung on admission, was confirmed by some of the most experienced stethoscopists in the hospital. According to these gentlemen, the posterior portion of the lung presented no signs whatever of disease, in about ten hours after it had passed into hepatization. Strange as this view may seem, it is in a satisfactory manner confirmed by the dissection, which shewed a much more advanced stage of disease anteriorly. The sudden changes in the signs here, and in the preceding case of Malone, tend to teach us, that *sometimes* our knowledge of the progress of disease must be imperfect, when derived from a single examination in the twenty-four hours, and that much may be learned from oft-repeated, as well

as careful explorations. Here, too, not only were the signs most variable, but the pathognomonic symptom of gangrene, *fœtor*, was only once discoverable, and that in the interval of the daily visit. Dr. Stokes* accounts for the intermission of the fœtor very satisfactorily, by the death of the patient so soon after gangrene set in. I think the same remark will apply to the appearance of the sputa, which Dr. Stokes observes, were unlike any he had ever met with in gangrene. Andral† gives one case in which, before the characteristic green expectoration appeared, the patient spat up copiously *a brown red fluid*. The descriptions also of Huxham and Stoll will apply to the present case. "The *livid, gleety, and sanious* expectoration, (says Huxham,) frequently resembling the *lees of red wine*, sometimes more black, and sometimes very *fœtid*, either proceeds from a gangrenous state of the lungs, or from a destruction of the crasis of the blood by very great acrimony, &c."‡ Stoll's description is precisely similar.§ It is worthy of remark, that in the above case no fœtor was perceptible in the expectoration. In the following one it is very evident; when present it is probably a more certain criterion than even that of the breath.

CASE V.—*Pneumonia in the third Stage; Signs of gangrenous Cavity; Recovery.*

James Makenna, æt. 40, a carman, of very intemperate habits, was admitted into the Navan Fever Hospital, November 20th, 1834. States, that ten days before, having been sitting on an open car the entire of a cold frosty night, he was seized with severe rigor, stuffing of the chest, and dyspnœa, dull pain in the lower part of the right side, cough, and scanty expectoration. For the last two nights he has been pretty constantly de-

* Clinical Lecture, Lond. Med. and Surg. Journal, vol. iv.

† Clinique Medicale, vol. i.

‡ On Fevers.

§ Aphorisms de Peripneumonia verâ.

lirious; he has also complained of the accession of great weakness and prostration.

On admission he complained of great pain and sense of oppression in the right side; respiration forty-eight, laborious and heaving, with loud tracheal rattle; speaking extremely difficult, (*parole entre coupée*;) severe and constant cough, attended with copious expectoration of a brown glaring fluid, mixed with small patches of viscid, dirty-looking flocculi; pulse 120, sharp, but very small and compressible; face pale, dusky, and anxious skin moderately warm; tongue clean, pale and flabby; bowels regular; decubitus on the left side and back.

Signs: on percussion well-marked dulness over the upper half of the right scapula posteriorly; over *the rest of the side a tympanitic sound*. Over the supra-spinous fossa, and anteriorly, respiration is puerile; over the dorsum scapula there is a mixture of bronchial respiration, with a large crepitus, and at the angle, and for a small extent to the external side, loud *cavernous* respiration and *pectoriloquy*, with occasional mucous rale: inferiorly there is a large crepitus, and laterally, from below the axilla, the crepitus of the first stage is distinctly audible.

During a long and repeated examination it was observed, that at intervals the cavernous respiration disappeared for a few moments, giving place *for* the time to a large mucous rale. Sonorous rale in left lung. There appeared but little hope under any treatment in so aggravated a case, but as active depletion was out of the question, I resolved to trust to local bleeding, and mercury in large doses; and ordered

Hirudines xii. axillæ.

Calomelanos ℥i. statim.

Eight, P. M. I again saw him; the temporary relief he felt after the leeching was over, and he seemed worse than in the morning; respiration very laborious, with loud rattle; countenance dirty and sunken; he moans incessantly, and seems apprehensive of speedy death, muttering "d——n these rat-

bles, nobody ever had them who did not die." I ordered a cupping glass to be applied over the leech bites, and the side to be cupped below the scapula, and twelve ounces of blood taken away.

℞. Decoct. polygalæ ℥vii. Carb. ammon. ℥i.

Vin. ipecac., tinct. scillæ ā ā ℥i. Tinct. opii camph. ℥iv.

Sumat ℥iss. 3tiis horis.

Repr. calomelanos ℥i.

21st. Was much relieved by the cupping, and passed a good night; general symptoms better; expectoration precisely similar to that in the *preceding case*, and has a gangrenous fœtor; the breath has the same fœtor, much increased by coughing; the tympanitic sound on percussion is confined to the neighbourhood of the angle of the scapula; the rest of the side posteriorly is dull; cavernous respiration, gurgling, and pectoriloquy are all present in great intensity at and near the angle of the scapula; and the vibration of voice felt by the hand is extraordinary, when compared to the same on the opposite side. I ordered the mixture to be continued, with the addition of ℥ss. of carb. ammon., and that he should get fifteen drops of liq. chlorid. sodæ every four hours.

22nd. The patient passed a good night, and is every way better; no fœtor of the breath. Signs: cavernous respiration; mucous rale and pectoriloquy continue at the same spot as before, but perfectly localized; and on moving the stethoscope an inch in either direction, the pectoriloquy becomes changed for a diffused resonance totally different. Over the dorsum scapulæ respiration had become pretty natural, but there is a fine crepitus laterally, and the sputa shew a mixture of those of the first stage; bowels confined; mouth slightly sore.

Haust. rhei statim.

23rd. Bowels were gently moved by the draught; soon after yesterday's visit, a profuse perspiration broke out, and continued the entire day; all trace of crepitus laterally has dis-

appeared; at the angle of the scapula the signs are the same as before; less marked however.

25th. Symptoms much improved; sputa catarrhal; the lower half of the side gives an uniform but slight shade of dullness on percussion; there is a good deal of large rale over the same region, and the cavernous respiration is now very indistinct.

Applicr. vesicatorium lateri.

Decoct. sarsaparillæ lbi. liq. potassæ ℥ii.

℥. St. cyathum 4ter in die.

27th. There is scarce any dullness on percussion, and no sign of cavity, except a little mucous rale near the angle of the scapula.

30th. Respiration nearly natural.

At the time of writing this paper, April 14th, this man continues in good health.

This case possesses a few features of interest apart from the immediate subject of the signs of typhoid pneumonia, on which account I introduced it, rather than as belonging to that type of disease. Some of these I shall briefly enumerate.

1st. The amendment produced by antiphlogistic and mercurial treatment at an advanced stage, and the vigorous and successful effort made by the constitution thus relieved, to terminate the disease critically on the eleventh day. The mercurial action decidedly seemed to follow rather than produce the resolution.

2nd. The signs of a gangrenous cavity. Had the clearness on percussion remained as diffused as it appeared to be when the patient was admitted, it might, as I shall hereafter prove, have co-existed with complete solidity of the lung; but its continued localization in the same spot with the other signs of cavity, render the diagnosis of this termination of pneumonia, in my mind, pretty certain; that the cavity was a gangrenous one, and not a simple pneumonic abscess, I infer from the foetor of the breath and sputa, and the peculiar appearance of the latter, as

to colour, consistence, &c. A case is given by Dr. Williams in his article on pneumonia, in which, from similar data, he inferred the existence of a gangrenous cavity in the same situation as above.

CASE VI.—*Pneumonia with Gastritis.*

Edward Murphy, æt. 29, a labourer, was admitted into the Navan Fever Hospital, March 24th, 1835. He was particularly drunk on the 17th, (St. Patrick's day,) and without farther known cause, was seized on the 19th with shivering, headach, nausea, and vomiting, and other feverish symptoms, followed in two days by *jaundice*, pain in the left side, cough, and rusty expectoration, and delirium. On admission, he presented the symptoms of gastritis, with remarkable prostration, and great disturbance of respiration, and the signs of pneumonia of the left lung, viz., dulness on percussion of the postero-inferior half, bronchial respiration at the base, and sharp crepitus, without respiratory murmur over the scapula, and in the lateral region; remainder of the lung and the right healthy.

V. S. ad $\frac{3}{4}$ x. cucurb. cruent. lateri mittr. sanguinis $\frac{3}{4}$ viii. Calomelanos $\frac{1}{2}$ i. statim.

25th. Only four ounces of blood could be obtained by cupping: the calomel griped him a little, and produced two evacuations, but neither the pain or purging continued. No change in the signs, except that they are more distinct, and crepitus is heard down to the very base.

Calomelanos $\frac{1}{2}$ i. statim. Hirud. xii. axillæ.

26th. Rather worse; expectoration more glutinous, and of a deeper colour; pulse 100; respiration more laborious, seems much prostrated; lies on his back. Signs: dulness increased in extent; is now complete as high as the spine of the scapula; from this point to the base loud crepitus is heard, mixed with feeble bronchial respiration; no ptyalism; bowels confined.

R. Ol. terebinth, ricini ā ā $\frac{3}{4}$ iii. Aquæ $\frac{3}{4}$ v.

℞. Ft. haustus statim sumendus.

Hab. ol. terebinth. $\frac{3}{4}$ i. 4ta q. q. horâ.

Vini rubri ℥iv.

Emplast. vesicat. lateri.

In the evening finding his prostration increased, with quick, feeble pulse, I ordered him a bolus of

Camphor. gr. iij. Carbon. ammoniæ gr. v. 3tiis horis,
and an additional four ounces of wine.

27th. Was delirious last night; bowels moved four times; symptoms indicative of sinking. Signs a little improved, the side appearing a little clearer, and the sputa more catarrhal.

℞. Decoct. polygalæ ℥vi. Mucilaginis ℥ij.

Liq. potassæ, vini ipecacuan. ā ā ℥ij.

Tinct. opii camphor. ℥iv.

℥. Sumr. ℥i. 3tiis horis.

Hab. bolus camphor. 6tis horis.

Vini ℥vi.

28th. Passed a good night; less sinking about him; pulse eighty-four, soft, and full; respiration easy; skin warm, and bedewed with perspiration: he had sweated all night; on this account I put off the examination of his chest, and ordered the wine and boluses to be suspended, and the mixture to be continued.

29th. Mouth a little sore; is improving rapidly. Signs: the entire side nearly as clear as the other; respiratory murmur audible everywhere, mixed with very feeble rale.

Contr. mistura.

31st. Convalescent; side clear; respiratory murmur pure, but rather feeble.

Decoct. sarsap. ℔i. Liq. potassæ ℥ij.

Sumr. cyathum. 4ter in die.

Had no farther bad symptoms.

CASE VII.—*Typhoid Pneumonia in the third Stage when admitted; Bronchitis and Gastritis; Death.*

Catherine Smith, æt. 26, married, was admitted into the Navan Fever Hospital, on the evening of March 28th, 1835.

States, that she was healthy up to ten days' since, that on the 18th, without assignable cause, except distress and fatigue, she was seized with shivering which continued for forty-eight hours, and was followed by feverish symptoms, headach, thirst, vomiting of green fluid, and pain in the left side; and afterwards by cough, dyspnœa, and viscid bright red expectoration; after the cessation of the vomiting, she had attacks of diarrhœa recurring occasionally and existing at present.

When admitted, her face was depressed, anxious, and slightly livid; surface cold; pulse 132, very small and compressible; respiration sixty in the minute, high and laborious in the extreme, with loud tracheal rattle; '*sermone multis parvulis-que inspirationibus interciso*;* incessant cough, and copious expectoration of viscid, tenacious, rusty sputa; exquisite tenderness of epigastrium; thirst; red, furred tongue; diarrhœa.

Signs: on percussion the right side anteriorly gave a healthy sound; the left *a sound of precisely the same kind as that produced by percussing over the stomach or cæcum*; posteriorly there was dulness over the spine and upper part of the scapula; respiration was tracheal under the clavicle; null below and over most of the anterior of this side; a very feeble crepitus was heard, with strong resonance of voice; over the entire side, posteriorly, a very feeble murmur of respiration, nearly quite inaudible in the upper portion; bronchitic rales over the right side.

The diagnosis of gastritis, bronchitis, and the third stage of pneumonia was easy, and the prognosis of a fatal termination equally so; this, however, was rather longer protracted than I at first expected, as she lived till the night between the 30th and 31st. The only change which took place in the signs, being a gradual diminution of the tympanitic clearness over the left side, and the increase of crepitus and bronchial respiration,

* Stoll justly enumerates this among the symptoms occurring 'in morbo gravissimo.'—*Aphorismi de Peripneumonia verâ*.

both anteriorly and posteriorly. The treatment consisted of cupping, blistering, camphor and ammonia, and wine.

Autopsy.—When percussed the left side gives a muffled, tympanitic sound, though less distinctly than on her admission. The left lung was found adherent to the pleura by recently formed lymph. The superior lobe was solid and heavy, presenting a marble appearance on its surface, and its section shewing an advanced degree of the third stage, being grey, softened, granular, and oozing thin grey fluid from its cut surface in large quantity. The lower lobe and the right lung were much engorged, and the bronchi of both were of a deep red colour, and lined with dark bloody mucus.

Both sides of the heart contained clots of fibrine. The stomach was distended with air; its inner surface exhibited extensive stellated redness, softening and thickening of the mucous membrane, which was smeared with bloody mucus. The ileum presented marks of inflammation for at least twenty-four inches above its termination, these were most evident in the follicles, “both isolated and aggregated,” which were remarkably tumified and injected.

This case illustrates satisfactorily the general pathology of pneumonia, rendered typhoid by complication with gastro-enterite, and the one preceding it, is, I think, a fair instance of much the same kind of case, yielding to the combined effects of local bleeding, calomel, and stimulants timely administered. This man seemed to have had a remission of the disease on the 25th, but the amendment was deceptive, and on the 26th I found by the increase of the dulness upwards, and the accession of greater prostration, &c. that the inflammation had in fact stolen a march upon me since the evening before. Under such circumstances, the experience of every case I had seen taught me, that nothing was to be hoped for from farther trial of either blood-letting or calomel, and that the free use of stimulants was my only resource. I accordingly applied a large blister to the side, and gave him wine, and having seen excellent effects from

the use of ol. terebinth. in some desperate cases of congestive bronchitis, I determined to give it a trial, watching the effects closely. I first gave a full dose as a purgative, and smaller quantities afterwards. By the report of the case it has been seen, that the increase of prostration in the evening called for an increased quantity of wine, and the addition of camphor and ammonia; and on the next day, as the turpentine seemed to have a depressing effect, while the lung was apparently resolving, I omitted it; immediately afterwards the inflammation terminated by crisis, (on the ninth day.) Of the effects of the turpentine I cannot speak with any certainty, but as it possesses all the inconveniences of calomel in the gastric form of the disease, without the same powerful curative action, I should not feel disposed to give it another trial in such a case.

I shall offer a few remarks on the *latency of signs* sometimes met with in the *foregoing* and other cases of this disease. This consisted principally in the absence of what is considered by some the pathognomonic sign of the first stage, crepitating rale; sometimes even in that of the second also, bronchial respiration. It has been observed, that in some instances where a few hours before no signs of pneumonia were present, dulness on percussion and bronchial respiration were found established, (Cases III. and IV.,) in others a degree of dulness on percussion, and feebleness of respiration, denoted the existence of a congestion which slid into solidification, without the signs of the first stage intervening. My inference from these facts is, "that the view of those who suppose that this disease is essentially a complication of pneumonia, with a superadded passive congestion," is correct; and I would answer the objections which may be made to the truth of the fact, and the validity of the inference, in this way. It, "the crepitus," had not *passed* before I saw the patient, as the disease sometimes seemed almost to begin, and commonly progressed under my observation, and that of others. My examinations were purposely so frequent, that it could scarcely have escaped in the mean time, and yet the

disease was traced onwards from a very small portion, till nearly the entire organ was engaged in some cases without crepitus being once heard, and in others a mere trace of it, until resolution or softening commenced. Then as to the inference; the proof that the disease is a passive congestion rests not merely on the signs, but also on the general symptoms and appearances on dissection, and is strengthened by the observation of the effects of blood-letting; these were strongly marked in Malone, (March 3rd,) but even more so in the following case, a brief report of which I shall abstract from my note-book.

CASE VIII.—*Double Pneumonia of low Type; Diphtherite.*

Peter Lynar, a labourer, æt. 28, was admitted into the Meath Hospital, March 2nd, 1833. He states, that six days before he caught cold, and had rigors followed by cough and pain in the *left* side, two days afterwards was bled with temporary relief. Last night he sat up at a wake, and drank a good deal of whiskey, and this morning suffers a great aggravation of all his complaints. He has hot skin; thirst; foul tongue; pulse 120, and very small; respiration extremely hurried and laborious; cough hard and frequent, with viscid, dark-brown expectoration. On percussion, the right side is dull over its whole extent anteriorly, the left posteriorly; the alternate portions clear; respiration slightly bronchial under the right clavicle; *almost entirely null over the rest of the side anteriorly*, except on making him inspire very deeply, when there is heard *occasionally* a little fine crepitus; over the posterior left crepitus is very distinct, mixed in its lower half with bronchial respiration; in the alternate portions the respiration is puerile.

After noting the above signs, he was bled to twenty-four ounces, and immediately afterwards the following report was made: the pulse fallen considerably in number, and become full; respiration *louder, and mixed with intense crepitating rale over the whole side anteriorly, and over the supra-spinous fossa*. In the evening Dr. Stokes visited him, and ordered the bleeding to be repeated to ten ounces, and twenty leeches

to the left side. The blood drawn in the morning remained soft without being buffed or cupped; that drawn in the evening was both buffed and cupped to a remarkable degree.

3rd. The crepitus on both sides was looser.

4th. The dulness on percussion on the right side diminished, and respiratory murmur much louder, and the rale very indistinct, except on coughing or a deep inspiration; loud crepitus over posterior left. No farther signs could be discovered in the right lung, and the resolution of the left was rapid and complete; but on the 5th he was found to have laryngeal cough and difficulty of speaking, depending on severe diphtheritic inflammation of the pharynx and larynx, from which he with great difficulty, and slowly, recovered.

I do not think I carry speculation too far, in supposing that here the pneumonia had existed for several days in the left lung, and had only just commenced in the right, under circumstances peculiarly favourable to the formation of the typhoid kind: that the signs of the first stage were marked by a great passive congestion oppressing the lung, and that had not its mechanical removal, by relieving the lung, given play to these, this stationary blood would have undergone a change, which, with the increased atony of the vessels, would have rendered its removal by venesection impracticable, and after a short interval of obscurity of the respiratory sounds, the signs of *solidification* would have become manifest. According to this theory the mechanical explanation of the absence of crepitating rale in such cases is easy; the air cells compressed by an accumulation of blood in the surrounding vessels are unable to expand blood, while fluid is a bad conductor of sound, and does not convey the respiration of the large tubes, until its change into a more solid matter renders it a fit medium,* and bronchial respiration is heard. As regards the proximate cause of such congestion, it appears to be essentially part and parcel of the typhoid type

* *Vide Andral's Pathological Anatomy, translated, vol. ii. p. 510.*

of inflammations wherever situated, and depends probably on the mode of access, or in other words, "the state of system at the time of seizure, and the nature of the exciting cause." In most of these cases the mind or nervous system being depressed by anxiety, intoxication, fatigue, or other such cause, and the surface chilled for a length of time, a *stase* of the circulation takes place in some internal organ; the lung, for example, whose cellular and vascular structure renders it perhaps the most liable to be thus affected: this, with the condition of the nervous system, speedily produces an altered state of the blood in the part, and even in the general circulation, as shewn in the appearance of the blood drawn from the arm in Lynar and many other cases I have seen. This evacuation may produce a new action in the congested part, the lung may become free, the nervous system rally from its state of oppression, and the blood return to its normal condition, and shew signs of increased action: or it may be too late, and the congested lung will go through the ordinary course of solidification and softening, and it may be gangrene. The knowledge of this fact, and its practical application, led some of the older writers to say, truly enough: "*in pleuritide peripneumonia, &c. si in sanguine e venâ sectâ extracto non appareat in superficie crusta alba, pessimum; si vero in altera sanguinis missione incipiat apparere, bonum: contra si in secundâ ne quidem apparebit, abstineto statim a sanguinis missione aliter interficies ægrotantem.*" As to the other explanations I have met in authors of this irregularity in the signs, none appear to me perfectly satisfactory. In a note in Forbes's Laennec, 4th edition, Dr. M. Laennec* accounts for the absence of rale, except during coughing, by supposing the inflamed portion to be always very deep in such cases, and combats the opinion of M. Chomel, that the phenomenon is owing to a corresponding pleuritis: this opinion of Chomel I found in Malone's case, but the same circumstance

which disproved it would equally apply to the other. Andral's explanation is similar to M. Laennec's, as is Rostan's also.*

It will be seen, that none of these will suit the foregoing cases, except perhaps that of Hay (III.) in which the pneumonia may have been principally central.

I shall next advert to the remarkable phenomenon presented by Cases II. and VII. of "*tympanitic clearness on percussion over a solidified lung, without air being present in the pleura.*" I do not know any word to express this sound; it varies in degree rather than in kind, from that produced by percussing over the empty stomach or cæcum, and is like the tintement metallique of percussion of Martinet and Andral, sometimes heard over a tubercular cavity; it is also at times as clear as in a case of plemo-thorax, as was the fact in Malone on the day of her death. It could not be confounded with the clearness of the healthy side, unless by a very careless observer; but it is still more different from the dull sound usually met with over a hepatized lung. In the 12th and 16th Numbers of the Dublin Journal, Dr. Graves has described two cases of pneumonia, accompanied with morbid clearness on percussion, which he explains by secretion of air from the inflamed pleura; and I observe, that the learned editor of the Medico-Chirurgical Review not only concurs in this explanation, but gives a case precisely similar to the one last related by Dr. Graves, adding, that "dissection has not yet confirmed conjecture in any of these instances." Having met with four cases in which the observation of this phenomenon was followed by dissection, I shall briefly relate them. The first, which at the time surprised me not a little, was that of a man named Drillon, who died of extensive inflammation of the left lung in the Meath Hospital in the spring of 1832. At the close of this case, from the *hollow* sound on percussion of the lower part of the left side, (previously quite dull,)

* Andral, Clinique Medicale, vol. i. Rostan, Cours de Medicine Clinique, 2nd part, 3rd chap. 4th sect.

a pretty general opinion existed, that a pneumonic abscess had formed, and burst into the pleura. The side was punctured accordingly, but no air escaped, and farther dissection shewed the pleura adherent to two-thirds of the lung, red and solid, but *no abscess*. The next was a man who presented himself at the same hospital, with the history and symptoms of phthisis, and on percussion under the right clavicle, there was such a remarkable muffled tympanitic sound, with tracheal respiration and resonance of voice, that all who heard these phenomena expected to find a large tuberculous cavity; dissection, however, shewed the lung hard and solid throughout from *chronic pneumonia*. The other two cases of Malone and Smith were similar to that of Drillon. It seems to me very obvious, that these cases cannot be brought under the explanation given by the high authorities just quoted, and I confess myself quite unable to give one which would be considered more satisfactory. The existence itself of the phenomenon, under the above circumstances, will, I am sure, be questioned, having myself more than once passed it by, almost without notice, from its singularity, until repeated instances forced me to admit the paradoxical combination. In some instances it has been accounted for, by the transmission of the sound of the stomach through the solid lung. I think this explanation will apply to three of my cases, which occurred on the left side; the fourth will demand a different one, and it might perhaps be found in the facility with which the vibrations of the air in the bronchus and its larger divisions might be supposed to be communicated through a lung in that condition, i. e. solid throughout, and, therefore, not permitting the loss, in a mixed medium of solid and healthy lung, of such vibration. This is a mere conjecture, which may be readily denied, and not easily confirmed. But of the fact I am certain, that a sound, equal at times in clearness to that of pneumo-thorax, may be yielded by (or rather through) a solid lung under certain conditions; and since the researches of Dr. Graves and Stokes, and M. Andral, have shewn, that absence

of all sound of respiration may exist in the same circumstances, I submit, that a great mistake is likely to arise from too hasty an explanation of these two phenomena, by supposing the existence of simple pneumo-thorax. As to the treatment of this form of pneumonia, the foregoing cases present, in different individuals, instances of the bad effects of free bleeding, and of the value of large doses of calomel, and of stimulants, early administered. Of the first I shall only say, that in almost every case of this disease, in which I have seen it used by myself or others, it has produced ultimately, if not immediately, all the bad effects which writers have attributed to it of local bleeding I can speak very differently, it is always useful, and generally indispensable. Having witnessed, during my attendance on Dr. Graves's clinique, the valuable effects of large doses of calomel, as advocated in his paper on the subject, in No. 16 of the Dublin Journal, I was led to adopt the plan in many cases of acute inflammations, which afterwards fell under my care. The least I can say of this mode of giving mercury in inflammation is, that it has never disappointed, though it has often surprised me. Its advantages over smaller doses seem to me to be ; 1st, that it never, at least given to the extent that I have had occasion to do, caused the dysentery or severe ptyalism produced by smaller doses. It may be seen, that not one of the foregoing cases so treated, were more than mildly salivated ; 2nd, it certainly seems to act much quicker than the smaller doses ; and 3rd, after giving a scruple, and repeating it in six hours, we may give any other medicine, without risk of interference, which may sometimes be a great advantage. It should be observed, that in all my cases I have enforced the strictest attention to diet, as recommended by Dr. Graves, generally confining this to very small sups of warm whey. There is a great prejudice in many minds against large doses of calomel, but while I have a horror of its indiscriminate use as a purgative, for which purpose I never prescribe it, I think in such instances as these, it is better to give it rapidly and surely, than to go on

day after day with small doses ; certain either that the patient will die before it affects the system, or that it will have accumulated by the time, so as to produce all its disagreeable effects in full measure.

In conclusion, I shall enumerate a few inferences I think deducible from the foregoing cases.

1st. Typhoid or asthenic pneumonia is distinguished from the ordinary form of the disease, by a superadded passive congestion, which modifies in different degrees the signs, progress, and termination of the inflammation.

2nd. That the complication, by obscuring the physical signs of pneumonia, may lead to a mistake in diagnosis, and is likely to be confounded with pleuritic effusions ; the more so since the characteristic symptoms of expectoration, &c. may be at the same time absent.

3rd. The correct diagnosis is to be arrived at by watching the progress of the symptoms and signs, and especially the change produced on the latter by the abstraction of blood.

4th. That the epidemic constitution of the disease, and its pathological conditions, (connected as both seem to be with an altered state of the blood,) often combine to render these cases prone to run into gangrene, and that they are otherwise tedious and intractable, and generally require the early and liberal use of stimulants, as well as the prompt but cautious employment of the most active means for subduing inflammation ; and, I think, the necessity for the former may be stated to be in proportion to the degree of prostration ; and the extent of passive congestion as indicated by dulness on percussion and nullity of all respiratory phenomena.

ART. XVII.—*Observations on the Question, whether the Comatose Symptoms in Apoplexy, Hydrocephalus, &c. are not frequently falsely referred to Simple Compression of the Brain as their Cause.* By J. MACDONNELL, M. D.

THE physical condition of the brain and spinal chord is a subject, which, it appears to me, is far from having yet received the notice to which its importance entitles it: and I am convinced, a careful consideration of it would lead to valuable practical and physiological conclusions. The following observations are made with the view of directing attention to the physical condition of the brain, especially with reference to the circulation of the blood in it, and to the pressure of the atmosphere upon it.

The effect of it upon the circulation of the brain has been glanced at by several writers, Abercrombie, Pritchard, Copland, and others. Dr. Abercrombie has dwelt more upon this subject than any other writer I am acquainted with, and has, I think, completely established the conclusion, that the absolute quantity of blood at any one time contained in the brain, is, in consequence of the resistance of its coverings, incapable of any sudden change by the action of the heart and arteries. Those who are sufficiently acquainted with the laws of atmospheric pressure, and the manner in which it may be conveyed to every part of the body by the circulating fluids, will admit, that the brain is as completely under the influence of, and acted upon, by the pressure of the atmosphere, or any additional pressure to which the surface of the body is uniformly subjected, as if the hemispheres were exposed naked, by the removal of the bones and membranes. Now, in many diseases of the brain, comatose symptoms, loss of sense and motion, stertorous breathing, &c., are still almost constantly referred by practitioners to compression of the brain as their cause, and I have no doubt the assertion will appear to many paradoxical, and absurd,

though it plainly follows from the above considerations, together with what we know positively of the effects of increased atmospheric, or other uniform pressure on the brain, that in the great majority of these cases, compression of the brain has no concern whatever in the production of such symptoms.

I found this conclusion on the following facts and reasonings: 1st, there is no medical man, who has seen much of diseases of the brain, who has not met with cases in which such symptoms were intensely developed, in which effusion or some other cause of powerful compression was confidently anticipated, and in which there was, nevertheless, no trace of evidence to be found on examination after death, of the existence of compression. Many such cases are on record: Abercombie speaks of several. The existence of these symptoms is, therefore, no conclusive proof of compression of the brain; 2ndly, many animals, in which the nervous system nearly resembles that of man, often undergo great pressure on the brain without inconvenience. I allude particularly to cetaceous animals, in all of which the brain and nervous system much resemble those of man, and one of which, the dolphin, is remarkable for the astonishingly close and unexpected resemblance between its brain and that of the human subject. The common whale, when struck by the harpoon, is known to descend to great depths. Captain Scoresby calculates, that at the depth of 800 fathoms the pressure on the animal's body must be equal to 211,200 tons. "This," he says, "is a degree of pressure of which we can have but an imperfect conception. It may assist our comprehension, however, to be told, that it exceeds in weight sixty of the largest ships of the British navy, when manned, provisioned, and fitted for a six months' cruise." Under this enormous pressure, of which the brain bears its just proportion, the animal is capable of exerting the full energy of life. But we are not forced to rely upon arguments from analogy alone, for lastly, men can descend with little inconvenience to considerable depths in diving-bells. My father, who descended in a diving-bell, and remained under

water at a depth of twenty-six feet, three or four hours, for the purpose of ascertaining some points respecting respiration, assures me, that he experienced no symptom referrible to the head, except a painful feeling in the ears, which went off in two or three minutes. Men descend and work with ease in the diving-bell, at still greater depths than this, and pearl-divers often go down to a depth of fifty or sixty feet, where the brain suffers an additional compression (making allowance for the greater weight of salt than fresh water, and the increasing density of the lower water) equal to about thirty pounds for each square inch of its surface. In none of these cases is there loss of sense or motion, or other comatose symptoms, and the rigorous and inevitable conclusion is, that simple compression of the brain does not produce such symptoms.

But it may be asked, if the extravasation of blood, or secretion of pus, in or upon the brain, the formation of false membranes, the effusion of serum, or other similar cause, usually looked upon as acting by compression, do not produce comatose symptoms by compression, in what way do they do so? I am not called upon for the defence of my position, to answer this question, nor can I, at present, I must confess, undertake to answer it generally; but I am convinced, that the effect on the circulation in the brain, of all such apparent causes of compression, is a circumstance of great importance in the production of such symptoms, if it do not actually produce them. To see what that effect is, let us recur to the peculiar condition of the brain with respect to the circulation, recollecting that the head is full, and that the quantity of blood in the brain is a given quantity, let us say a pound, which cannot be changed by the circulating powers. Now let an apoplectic extravasation take place into the ventricles and brain, to the amount of eight ounces, this will occupy the space before occupied by eight ounces of circulating fluid, and the brain will be immediately deprived of half its supply of blood. No one will wonder, that in so delicate an organ, such a circumstance should produce

violent symptoms, or even be speedily fatal. In the instances of great compression of the brain, unattended by any symptoms which I have adduced, it will be perceived, that the circulation in that organ is not interfered with. An effusion of pus, serum, or lymph, or the development of a tumor, if they take place so quickly as to prevent the possibility of space being made for them, by an alteration in the nutrition of the cerebral mass, will produce effects precisely similar, and proportioned to their volume. Further, any cause which considerably and suddenly diminishes the supply of blood to the brain, should have a corresponding effect. Whether in any of the cases alluded to, in which coma occurred without any evidence of compression, such diminution existed, I know not, but the inquiry is, I think, worth making in similar cases.

Compression of the brain has likewise been advanced in explanation of phenomena occurring in physiological experiments, where no such compression exists. Nysten, who has published many valuable experiments on the effects of gases injected into the blood-vessels, looks on the death caused by the injection of air into the carotid, as being occasioned by the compression of the brain by that fluid. But death occurs in this case, in consequence of the injection of a quantity of air quite inadequate to such an effect. Bichat, in his work on *Life and Death*, expresses the opinion, that air injected even into the venous system causes death by its action on the brain, but declines delivering any opinion as to its *modus operandi*. "Whatever," says he, "be the manner in which it kills, the air is mortal on arriving at the brain, and that is the essential point." Magendie, in a note on this passage, in his edition of Bichat's work, declares his belief, that in this case death commences at the heart, of which the right auricle being over-distended by the air, loses its contractile power, as the bladder does when over-distended with urine; and Boerhave attributes the death to the clogging of the pulmonary capillaries with air, which so puts a stop to the circulation. I will not deny that any of these may

be the cause of death in certain cases, but from what I have seen of such experiments, I am convinced, that none of them is the common cause. What will be found usually to occur is this: the injected air is quickly conveyed to the right auricle, the contraction of which drives it partly back on the veins, partly into the ventricle. The auriculo-ventricular valve is incapable of completely confining the air, and instantly that the auricle relaxes, it is again filled with air, partly from the ventricle, partly from the veins. In this way the auricle will be observed, at the instant of each relaxation, to become distended with air, which thus stops the circulation, and of course causes death. I am the more surprised at Magendie's opinion, as one of the experiments from which I have drawn this conclusion was performed by him, and while the animal was lying insensible, and dying, the auricle was still acting with such force, as to drive, at each contraction, blood and air, with great violence, through the wound in the femoral vein, by which the air had been injected.

ART. XVIII.—*Case of Tetanus, treated with Tartarized Antimony.* By EDWARD WOODWARD, Esq., Kells.

THE various remedies which have been tried in tetanus, and the generally unsuccessful result, induce me to detail the treatment of a case which came under my care, early in January, 1833. I was called on to attend James Collins, a labourer, living at a bog side; I found him with all the symptoms of tetanus; the muscles quite rigid, the abdomen hard as a board, that expression of the countenance so characteristic of the disease, and the muscular contractions so violent, as to keep him resting altogether on his heels, and the back of his head. Those symptoms had been gradually coming on for two days before, and were increasing in violence and frequency of parox-

ysm : the muscular contractions never relaxing. He was able to speak, and to swallow a small quantity at a time, but with great difficulty. He was twenty-eight years of age, of temperate habits, healthy, and muscular. On inquiry into the cause, none could be assigned, except that he had been exposed to cold and wet, baling water from an underground kitchen ; this was about a week before the symptoms of tetanus appeared, but in the intermediate time he had given himself a severe strain of the back, carrying loads of rushes to fill a hole, in order to make a pass in the bog. On the second day of the appearance of the disease, he had been seen by an apothecary, who bled him, but the symptoms becoming more severe, and his friends being apprehensive of his immediate death, applied to me. His pulse was full, strong, hard, and quick ; he had tightness and pain of the chest ; bowels were constipated for some days ; chest and face covered with perspiration. I ordered him calomel and Dover's powders, in the proportion of two grains of the former, to eight of the latter, to be repeated every third hour, a large blister to the back, extending from the occiput to the sacrum, and a turpentine enema, to be repeated every four hours if necessary. Living at seven miles distance, I was unable to see him until late the next day, when all the symptoms had become more severe. The bowels had not been acted on, and although he was covered with a profuse perspiration, the tetanic rigidity and spasms were increased. Having frequently observed the inefficiency of large doses of opium, and thinking that that medicine had only increased the muscular contractions, and being unwilling to employ tobacco, from the uncertainty and danger of that remedy, I determined to try the effects of tartarized antimony, and, therefore, ordered the calomel and Dover's powders to be discontinued, and gave a solution of twelve grains of tartarized antimony in twelve ounces of water, a dessert spoonful to be taken every hour ; the dose to be lessened if vomiting or extreme weakness were produced ; the turpentine enema I directed to be again used before night.

The next day he appeared much weakened, his pulse lower, less hard, and smaller; the muscular rigidity evidently diminished. He was able to swallow with more ease, and the enema had brought away copious black, fetid evacuations, mixed with blood. There was still pain in the chest, and cough. As the tartarized antimony was discontinued early in the night, from the weakness induced, I ordered the dose to be lessened to an eighth of a grain, repeated every third hour, and a pill consisting of half a grain of ipecacuanha, three grains of extract of hyoscyamus, and one of blue pill, to be taken three times a day. A large blister to be applied to the sternum, and the turpentine enema to be again repeated in the evening. The next day he was evidently better, and was not so weak. I ordered the tartarized antimony and pills to be continued with the enema as before. The day following he was much better in every respect, I therefore discontinued the tartarized antimony, but ordered the pills to be repeated, as there was yet some cough; the evacuations from the bowels were becoming natural. The day following he was much improved in every respect, and as he continued daily to amend, his medicine was gradually lessened, and in a few days more he was convalescent.

As I have not since had an opportunity of giving tartarized antimony in tetanus, I will make no observations on its use, except that it evidently diminished the muscular rigidity, lowered the pulse, and caused the bowels to be acted on by the enema, which, before its administration, had had no effect; to it, therefore, although I employed other means, I attribute the recovery of this case.

ART. XIX.—*Case of Extra-Uterine Foetation*. By DR.
MACARTNEY.

“ TO THE EDITOR OF THE DUBLIN JOURNAL OF MEDICAL AND
CHEMICAL SCIENCE.

“ Enniscorthy, May, 1835.

“ SIR,

“ I am induced by the extraordinary facts of the following case, to offer them for the consideration of the professional world. The details were of so novel a character, that I gladly availed myself of the presence of Surgeon Wilson of this town, and my son, Dr. John B. Macartney, of Ferns, to assist in investigating them in the most accurate and careful manner. Should you consider them not unworthy of a place in your highly talented Journal, I shall feel obliged by their insertion.

“ I am, &c. &c.

“ J. MACARTNEY, M. D.”

ELLEN ROCHE, Cranmore, two miles from Newtownbarry, æt. 40, brown hair, fair complexion, has had four living children, and aborted of a fifth. States, that about nine months ago, being within a few days of her full time of a sixth child, she received a kick from a cow in the abdomen, while in the act of milking her, in consequence of which, she was knocked down and rendered insensible. In this state she was found by her family, and carried into the house. After being laid on a bed, and recovering a little, she complained of intense pain in the region of the uterus, followed by sickness of stomach, and frequent vomiting of matter, resembling in colour the grounds of coffee: with little abatement of her symptoms, she continued for some hours, when she was visited by the surgeon of a neighbouring dispensary, who took a large quantity of blood from her arm, and prescribed some medicines, with a view of allaying the irritation of the stomach. By this treatment she experienced

considerable relief; the pain in the lower part of the belly, and sense of bearing down, until the evening of the fifth day, when she was attacked with all the feelings and symptoms characteristic of her former labours.

After continuing without intermission for eight hours, and when expecting every moment to be delivered, the uterine pains suddenly ceased, and did not return again. On the following day the mammæ were fully distended with milk, and that secretion presented itself quite as copiously as on previous occasions. From all the symptoms of parturition she became quite free in the course of a few days. There were no after pains, neither was there any discharge of blood or liquor amnii per vaginam. The only unpleasant sensation experienced was that expressed by herself, of "a dead, heavy load," and bearing down at times, much increased when in the erect position. After the expiration of some weeks from this period, she began to feel the body and limbs of the child through the parietes of the abdomen, and at the time she consulted me they were still more evident to the touch. By placing her in a recumbent position, we could readily bring a portion of the foetus to be distinctly felt by the hand. A leg, arm, and the face, were alternately presented for examination, and we could with the utmost facility delineate the knee, ankle, and toes of the first; the elbow, hand, and fingers of the second, and the forehead, mouth, and chin of the last, were as clearly perceptible as if handled through a couple of folds of linen. It seemed to require considerable exertion on the part of the poor woman to effect this object, as she complained of much weariness and lassitude afterwards. From repeated examination I was convinced, that the abdominal parietes, to the normal extent of integument, fasciæ, muscles, and adipose tissue, did not exist between the foetus and my hand. At the present time she appears to be in excellent health and spirits, and pursues the usual avocations of a farmer's wife, without suffering any serious inconvenience. Her general health and appetite are also good; bowels regu-

lar ; micturition unimpeded. The catamenia returned in about six weeks after the accident, and have always since been present at the accustomed period, and in the usual quantity. She has not had any soreness or tenderness on pressure of the abdomen for the last seven months. On being questioned, she replied with honesty, that she had renewed the connubial intercourse with her husband, shortly after the return of the catamenia, and persisted in it undeterred by the probability of impregnation or its consequences.

ART. XX.—*Letter from Dr. CHURCHILL.*

TO THE EDITORS OF THE DUBLIN JOURNAL OF MEDICAL AND
CHEMICAL SCIENCE.

104, Stephen's-green, May 15th, 1835.

GENTLEMEN,

I am anxious to acknowledge and to rectify some errors which crept into my paper on "Instrumental Delivery," inserted in the March Number of your excellent Journal. I am indebted for their discovery to the research of my kind friend Dr. Breen, who pointed them out in an able paper on the "Use of the Midwifery Lever," read at a recent "conversazione" at the College of Physicians. There are three mistakes, two affecting the first, and one the second table. In the first place, I misunderstood an expression of Dr. Breen's, in his Report. He mentions sixty-two operations, whereas I have stated but forty-four; secondly, as I do not possess Boer's works, I relied upon the accuracy of the tables affixed to Dr. Merriman's Synopsis, and was thereby led astray. His cases amounted to 13,955, and the operations to seventy-five, instead of the numbers inserted in my tables.

This alters somewhat the proportional frequency of operations; among British practitioners the number of cases are 29,195, and of operations 185, or about one in 162. And in Germany there were 949 operations in 35,788 cases, or about

$1\frac{3}{4}$ to 37. The third error arose from my copying Dr. Clarke's *tables* merely. Of the fourteen forceps cases mentioned in the tables, he *subsequently* states, that seven died and seven recovered. This I somewhat carelessly overlooked. The number of women who recovered after the use of that instrument, must now be estimated at 872 instead of 877; of those who died, at forty-eight instead of forty-three, and the relative proportion of the fatal cases as $1\frac{1}{3}$ in 19, instead of $1\frac{1}{3}$ in 21.

I seize the earliest opportunity of correcting the errors into which I have fallen, as the best apology I can offer to your readers for having misled them. Though these alterations affect the numbers to a considerable degree, still they do not touch the principle which it was the object of my paper to develop. I am aware of other apparent objections to that principle, which demand still further and more minute investigations, but for which I have not hitherto had time. I hope, however, before long, to avail myself of the facility your pages afford, and to lay before the profession a second series of researches, elucidating some points touched upon too lightly in my last.

I have the honor to be, Gentlemen,

Yours very sincerely,

F. CHURCHILL.

ART. XXI.—*Propositions relating to Diseases of the Stomach.* By JONATHAN OSBORNE, M.D., President of the King and Queen's College of Physicians in Ireland, Physician to Sir Patrick Dun's and Mercer's Hospitals, Member of the Royal Literary and Historical Society of Quebec, &c.

HAVING collected a great number of faithfully reported cases of diseases of the stomach, and having in the course of my treat-

ment of them, arrived at conclusions which appear to me of practical importance, I take this opportunity of communicating them to the public. The following propositions are the first of a series which I hope to be enabled to bring forward in this Journal. I adopt the plan of delivering my opinions in the brief form of aphorisms or propositions, in favour of those who may not have time to read any further details, and also from a conviction, that the general adoption of that method is suited to confer important advantages upon medical science, by the greater precision of which it is susceptible.

Diseases of the stomach ought, according to my views, to be divided into four classes; 1st, irritation of the gastric glands; 2nd, irritations of the mucous membrane; 3rd, torpid digestion; and 4th, spasmodic and sympathetic disease. To the first class the present observations shall be confined.

FIRST PROPOSITION.—*Sour eructations and vomiting of sour fluid, with a sense of distention in the stomach after eating, proceed from an undue secretion of the gastric glands, they being at the time in a state of irritation.*

The introduction of a new term for a disease, characterized by such ordinary, well known, and often described symptoms as the above, may seem unnecessary, and requires some apology. A careful investigation of the subject having shewn, that those symptoms, although often to be found connected with dyspepsia, yet are not that disease, and that although sometimes combined with inflammation of the mucous membrane, yet that they occur under a different state of things, it became necessary to ascertain to what pathological state they actually belong. Amongst the experiments of Tiedemann and Gmelin, there are many facts which shew their connexion with the gastric glands. In those it was found, that they poured forth their peculiar acid fluid, according as it appeared to be required by the nature of the food; that where indigestible substances were taken into the

stomach, the secretion was more abundant than usual, and that also in proportion to their indigestibility; and when stones or other substances wholly incapable of undergoing the process of digestion were taken in, the secretion became enormous. The long continuance of sour eructations, and sour vomiting, not being followed by alterations of the mucous seat of the stomach, but by scirrhus and ulcerations of the lesser curvature, and of the pyloric portion where those glands are known to be most abundant; secondly, the acidity (as may be proved) not being derivable from the food taken in, nor from the mucous membrane; while the acid fluid has actually been pressed from the glands now mentioned; thirdly, the food most suitable for the relief of these cases, being most injurious in affections of the mucous membrane; fourthly, the appetite also being unimpaired, while in gastritis it is always affected; and fifthly, opium having a peculiar effect in diminishing this secretion;—all these circumstances have appeared to me to form a body of evidence, to prove, that sour eructations and vomiting are derived from no other source than irritation of the gastric glands.

SECOND PROPOSITION.—*The irritation, and consequent secretion of sour fluid, is in proportion to the difficulty of digestion of the articles taken into the stomach.*

For the experimental proof I may refer to the experiments already alluded to. Persons of ordinary good health are yet liable to sourness and distention after eating pastry, in which the mixture of oil and starch are peculiarly indigestible. Salad, which resists the stomach a long time, in consequence of retaining its own vital forces, also the oily fish, as salmon, are frequently followed by sour eructations. With the two latter articles, the sourness is prevented or rendered less troublesome by the addition of vinegar, which acts as an astringent on the gastric glands, and checks their excessive secretion, or by

spices, or alcohol in different forms, as liqueurs, &c., which act nearly in the same way.

THIRD PROPOSITION.—*It is also aggravated by the bowels being in a state of inactivity.*

The benefit derived from a lax state of the bowels in this complaint is most decisive, and in many cases permanent, while any relief produced while the bowels continue torpid, is seldom more than transitory. In the commencing or slighter forms, the administration of purgatives alone is sufficient to remove acid eructations and sense of distention after eating. When, however, these have continued for some time unchecked, then a torpid state of the bowels, of a permanent and pertinacious character, is their most usual accompaniment, and requires to be removed by appropriate treatment. When those symptoms occur merely in consequence of the ingestion of indigestible food, they continue until the irritation has extended to the bowels, when the sufferings of the individual are commonly terminated by the occurrence of a diarrhoea. All those facts shew the connexion between defective action of the bowels and an irritable state of the gastric glands; but although thus connected, they are different affections, and, therefore, may exist independently, and require distinct treatment. Dyspepsia, or torpid digestion, is, as we shall hereafter endeavour to explain, an independant affection, and to be distinguished from that before in some instances existing by itself, as shall be demonstrated by cases.

FOURTH PROPOSITION.—*When long continued it may proceed to an enormous extent, the secretion being kept up, although there is no food in the stomach, constituting the disease called pyrosis; and its ultimate tendency is the formation of scirrhus and cancer.*

In pyrosis the vomiting usually takes place in the morning,

or at night, when there is no food in the stomach, and the fluid ejected is more or less transparent, acid, and covered with a froth resembling that of yeast. The states of gastric irritation which may be considered as passing into this, are those in which the greatest pain is felt when the stomach is empty, and relief is obtained by taking food. In such cases the presence of the acid fluid in the stomach is sufficient to produce pain, but not sufficient to occasion vomiting, and in many instances we find the patient relieving himself, by bringing on vomiting by artificial means. The following cases are of this description.

Ellen Maguire, aged 21, admitted into hospital, October 3rd. *Pain in the region of the stomach, generally when it is empty; the pain is relieved by eating; sour eructations, and vomiting of sour fluid, attended with relief of the pain; catamenia absent four months; meat agrees best with her stomach; pulse natural. Those symptoms have lasted nearly three years.*

Camphorated senna mixture ad effectum.

℞. Nitrat. argenti grana iv.

Aquæ distillat. ℥viiij.

℥. Sumt. ℥ss. omni hora.

7th. At first some nausea was experienced after taking the solution, which has ceased. The pain is diminished, and the vomiting has never occurred since.

10th. Bowels torpid, otherwise free from complaint.

℞. Mass. pil. galbani. comp. ʒi.

Extract. aloes aquos. ʒss.

℥. Ft. pil. xxiv. Sumt. iij. omni nocte.

Pain and vomiting not having recurred, she was dismissed in a few days.

Mr. P., aged 39, came under my care, 24th February, 1833, with a pain in the epigastrium, not increased by pressure. Vomiting of watery acid fluid, to which he has been subject nearly nine years; *the vomiting eases and sometimes entirely removes*

the pain ; appetite good until within the last few days ; food now mostly rejected ; pulse seventy-four ; tongue white, but moist ; abdomen feels empty, and rather retracted ; bowels habitually costive, has not been freed during the last three days ; all the purgatives taken having been rejected by the stomach. He was placed under mercurial treatment, his mouth became sore, and a slight effect was produced on his bowels. In consultation with an eminent practitioner of this city, since dead, several efforts were made to produce copious evacuations, but in vain. The pulse became more frequent, the stomach more irritable, and at length he could retain only cold water. In compliance with the anxious desire of his friends, and with the consent of Dr. Crampton, whose assistance was now obtained, we agreed that he should make a trial of fluid mercury. He took a pound weight, being nearly an ounce by measure in my presence. He swallowed it in two deglutitions, and immediately gasped for breath in a state of great anxiety, then vomited, but none of the mercury came up. No effect on the bowels was produced, and in the vomiting which continued during the following days, the mercury appeared in minute globules, having caused no appreciable inconvenience while in the stomach. The matter vomited was on different occasions bloody, and of a fetid odour. During the last four days he would submit to no further remedies ; all having proved ineffectual, either to cause action of the bowels, or ease from the vomiting. He gradually sank, and died on the 13th of March. On examination of the body, the pyloric end of the stomach was found above half an inch in thickness, which gradually diminished towards the cardiac extremity, where it entirely disappeared. At the lesser curvature, towards the pylorus, there was an ulcer about the size of half a crown, with jagged edges, which had perforated through the scirrhus mass in this part, and had reached the peritoneal membrane. The pylorus was so contracted, that an ordinary sized quill could scarcely be passed through it. The interior of the stomach, at the pyloric half, was uneven from

masses of scirrhus projecting into it ; but except at the ulcer, the mucous membrane was in a state of integrity, being of a reddish purple colour. No emaciation had taken place until within the last three weeks, and notwithstanding the enemata and other means used to move the bowels, there was a considerable quantity of fæces in the large intestines, but unaccompanied by air.

The means commonly adopted for relieving heart-burn are alkalies, as magnesia, &c. which appear to combine with the free acid, and thus diminish its activity. Under their use, the eructations which sometimes leave a sensation in the fauces, approaching to that of excoriation, become milder, or cease for the time, and the painful distention declines. When, however, the secretion is copious, and occurs without the stimulus of food, as in pyrosis, then the attempt to diminish the severity of the symptoms, by neutralizing the acidity of the stomach, appears quite futile, and no impression has been made upon such cases, except by remedies acting on the secreting organ, as narcotics, astringents, or effective purgatives.

The transition from pyrosis to scirrhus and cancer may be traced by examining the history of all the cases of those latter diseases. Unless when unattended by any appreciable symptoms, in consequence of the disease being situated at the lesser curvature of the stomach, (concerning which we shall produce evidence,) the disease usually consists for a considerable time only in eructations, then vomiting of sour fluid, or pyrosis, until at length vomiting of blood, or of matter resembling coffee grounds, supervenes, along with a change in the symptoms, and after death, ulceration with thickening is detected. It will be observed, that those cancerous affections are not preceded by the symptoms of gastritis, until after the change in the vomiting above mentioned has taken place, so that the weight of evidence clearly proves, that pyrosis follows sour eructations, and that in time it is followed by scirrhus or cancer.

The terms scirrhus and cancer may seem liable to objec-

tion. Those diseases being considered by some as essentially hereditary, or at least inherent in some constitutions, while the bulk of mankind are exempt; it may appear improbable, that this disease should take place, merely in consequence of long-continued irritation of the gastric glands in persons who have no hereditary disposition thereto. In reply, it must be observed, that it signifies little whether the disease be identical or not with cancer of external parts. It is evident from an examination of a great number of fatal cases, that the disease now before us is not hereditary, and that it attacks adults of all ages, and of every temperament, who have been affected with pyrosis. When a considerable degree of thickening and induration have taken place, pungent lancinating pains, resembling those of cancer, are usually felt, and in many cases scirrhus structure is found in the liver, or in the uterus, the whole system appearing to participate with the change going on in the stomach. Those are the principal reasons for calling this disease scirrhus or cancer. If, however, they appear insufficient, it is of no moment as affecting our proposition, still it will remain true, that this peculiar disease, which is *commonly called scirrhus and cancer of the stomach*, is the result of long-continued irritation of the gastric glands.

FIFTH PROPOSITION.—*The formation of scirrhus and cancer of the stomach takes place most readily in persons addicted to spirituous liquors, or who suffer from grief or long-continued anxiety.*

While irritation of the gastric glands has the direct tendency to produce scirrhus, and if kept up for a considerable time, will certainly end in it, yet there are circumstances which cause the same morbid change with comparatively a small degree of previous irritation. The habit of drinking spirituous liquors may be considered as a constant topical application of a powerful astringent, which, by repressing their secretion,

causes induration of those glands. An examination of the cases of this disease occurring in hospitals, will reveal many specimens of this nature, in which the disease is not only induced, but the fatal event succeeds, with a peculiar rapidity, in consequence of the constitutional irritation, which is always the result of this destructive practice. Among patients belonging to a higher station in society, a majority will be found who have been a prey to the corroding cares of life, and in particular to that painful anxiety which is occupied on a contingency that may never take place. A young lady, whose case shall be hereafter described, was in love under peculiar circumstances, which rendered her prospect of marriage remote and uncertain. In the case of Buonaparte, the disease made its most rapid advances about the time when his hopes of escape were covered with the darkest clouds, without yet being quite extinguished; and the disease of Mr. P. already detailed, as well as that of another now in my recollection, were by their friends distinctly attributed to anxieties about pecuniary transactions. We shall hereafter have occasion to inquire into the close connexion of the gastric glands with the nervous system, and to examine the cases in which we find them in a state of irritation, in consequence of affections of the head. It will then appear, that excited action of those glands is a natural effect of the circumstances now stated.

SIXTH PROPOSITION.—*When the glands in the lesser curvature are the seat of the disease, much less disturbance is felt than when the greater curvature is affected.*

The following cases are illustrative of the insidious advances which the disease makes, as long as the greater curvature remains in a healthy state. Whether this fact arises from the latter curvature being less frequently in contact with the contents of the stomach, I cannot venture to determine, and wish to confine myself to facts.

Hugh Reilly, aged 77, died in Stevens' Hospital, in Octo-

ber, 1832, with aneurism of the aorta, and imperfect closure of the aortic valves, bronchitis, and general dropsy. His appetite was remarkably good up to within a few days of his death, nor had he vomiting until this period, when it was generally brought on by coughing. He did not at any time after his admission refer either to the region of the liver or stomach, as the seat of pain. On examination after death, there was found, close to the cardiac orifice of the stomach, a cancerous ulcer, about the size of half a crown. It was raised above the level of the mucous membrane, the edges composed of a soft fungous mass were irregular, inverted, and everted, the centre was depressed and hard, very irregular, and of a greyish colour. An interval of only one-third of an inch separated its edge from the cardiac orifice. The mucous membrane near the pylorus, and along the lesser curvature was very rough, softened, and presented a punctated injection. The mesenteric glands were enlarged, hardened, and converted into scirrhus structure. The liver was not enlarged, but was studded throughout with scirrhus masses, varying in size from that of a pea to the largest walnut; their shape irregular, and those on the surface projecting far above it, with raised edges and depressed centres. Those were hard, white, and striated when cut into, presenting the appearance of a bad turnip. Some of them were of a creamy consistence. The gall bladder was filled with black and very viscid bile. Kidnies quite healthy.

Robert Bryan, a labourer, from Wicklow, aged 60, admitted to Sir P. Dun's, 19th June. Emaciation; jaundice; diarrhoea; about fifteen dejections daily of yellowish colour, and waxy appearance, floating on water; cough, with copious expectoration; auscultation evincing bronchitis; slight oedema of the feet; duration of the diarrhoea eight weeks, of the cough four years; the diarrhoea is attributed to cold; *his appetite is good; pulse nearly natural, and has not vomited.* Under the administration of opiates the diarrhoea was diminished, but he sank and died on the 22nd, *having retained his appetite to the day before his death.*

Appearances on Dissection.—At the lesser curvature of the stomach, within about two inches of the pylorus, was a large cancerous ulcer, with hard and thickened base and edges, about the size of a crown. The rest of the stomach was nearly natural. The gall bladder distended with green bile, the duct pervious, the passage of the bile through the duct being impeded by a great distention of the duodenum, which was turgid with flatus; the valvulæ unusually prominent. The liver and intestine nearly healthy, except slight traces of inflammation in the colon and rectum.

Miss B., a young lady, aged 20, had been occasionally under my care, when affected with febrile symptoms, in consequence of cold. Of late she began to complain of pain in the stomach, and pyrosis coming on at night, for which she took magnesia and other alkaline preparations, with some benefit. She also used aperient pills to obviate the costiveness to which she was liable. Her general state however was such, as to cause her to make no complaint. The complexion was florid, the skin the fairest, and she was apparently in the full bloom of health. It is proper to mention, that she had formed an attachment which must have been to her a source of the most unceasing disquietude, in consequence of circumstances connected with the object of it. On the 25th of April, she had taken a long walk, accompanied by a friend, who stated, that she made no complaint during the day. She had retired previously to dinner, and was fixing her girdle, when she was instantaneously seized with a violent and exquisite pain, such as she had never before felt, shooting downwards from the region of the stomach. She uttered a shriek, and would have fallen to the ground if not prevented. The pain continued unalleviated by any means which her family used, and was accompanied by an urgent, but ineffectual desire of passing urine. As I was prevented by illness from attending, a medical practitioner in the neighbourhood was summoned; a draught of castor-oil and turpentine was given, which was partially rejected by vomiting, although

with this exception, all her efforts to vomit were unattended by any discharge. In about two hours her extremities began to grow cold, and the perspiration of death commenced. During the ten hours which elapsed between the accession of the pain and her death, she enjoyed the full possession of her intellectual faculties, expressed her sentiments relative to her dissolution, which she was convinced was at hand, and mentioned the coldness of her extremities, and the clammy perspiration, as proofs of its speedy approach. She made several requests to be carried into effect after her death. The pain decreased towards the last few hours, and when she expired, her attendants thought that she had only fainted.

Having obtained permission to examine the body, I was able to attend for that purpose, thirty-two hours after her death. The appearance of the exterior was remarkable, as characteristic of freshness and health. On opening the peritoneal cavity, a quantity of fetid and pungent gas rushed forth, and some of the castor-oil and turpentine, a mustard emetic which had been administered by her friends, and the other contents of the stomach, were found mixed together amongst the intestines in the cavity of the peritoneum. The stomach was empty and collapsed, its contents having burst through an opening of about half an inch in diameter, formed by ulceration at the lesser curvature, rather nearer the œsophagus than the pylorus, and towards the anterior portion. The margin of this opening was not jagged, but presented black streaks. Around the opening there was a thickening and induration, which gradually diminished and disappeared before it reached the greater curvature. It was thickest towards the œsophagus: the liver was healthy. On the concave surface of the left lobe, over the opening in the stomach, was a plate of lymph apparently of old formation, the size of which exactly corresponded to the opening, and appeared to have been torn away immediately before the fatal effusion of the contents of the stomach. The perito-

neum presented no indication of inflammation, having only a whiter and more opaque appearance than usual.

Those three cases are sufficient to produce as specimens of the disease when in the lesser curvature, existing along with good appetite, and very slight symptoms of irritation of the gastric glands, while no similar cases have occurred within the range of my experience when the greater curvature was affected. The last case is a specimen of the destruction of life long before the usual course of the disease, in consequence of the rupture of the stomach from ulceration, and the consequent effusion of its contents into the cavity of the peritoneum. I might detail another case of a man, a patient in Sir Patrick Dun's, in which a similar event took place in consequence of cancerous ulceration at the lesser curvature, and in which death followed in twelve hours. In this case, as well as in the former, there was the sudden invasion of the agonizing pain, such as the patient never felt before, and the same vain desire to pass urine. The peritoneum also presented the same appearance. We may remark here, incidentally, that the patient in those cases cannot be said to die from peritoneal inflammation, inasmuch as death occurs before it has taken place, and there is no appearance denoting that it has been set up. The shock to the system is so overpowering that nature makes no effort to counteract it; and coldness of the surface, and profuse perspiration, are proofs that the vital forces have sunk under its violence. For a valuable case of rupture of the stomach, coinciding with the above in most particulars, I beg to refer to Dr. Crampton's paper, published in the transactions of the Association of the College of Physicians.

In addition to the present proposition respecting the different effects arising from difference of locality in the stomach, I hope to be able to prove, when treating of the mucous membrane, that affections of the pyloric end of the stomach are characterized mostly by vomiting, and those of the cardia by loss of appetite.

SEVENTH PROPOSITION.—*Benefit in those cases has been derived from a restoration of the activity of the bowels, the avoidance of indigestible food, and the administration of certain astringents, aromatics, and alkalies.*

The best treatment hitherto employed in these affections is comprised under the above general classes. The avoidance of indigestible food is usually practised by the patients themselves without medical advice, and solely from experience of the distention and pain after indigestible substances have been taken into the stomach. The good effects of certain astringents have caused them to be adopted in many cases by practitioners without any well established opinion to guide them as to their mode of action. Thus the oxyd of bismuth was first employed by Odier of Geneva, as an anti-spasmodic in this disease, which he believed to arise from an inordinate irritability of the muscular fibres of the stomach. Its mode of action appears evidently to be astringent. As is usual with metallic astringents, when taken in an over dose, it produces inflammation. By its astringency it restrains the secretion of the gastric glands, and thus prevents the pain and distention of the stomach which the presence of that secretion in undue quantity occasions. The same mode of action is the source of the benefit which has been experienced from catechu, rhatany, and rhubarb, the latter having the additional advantage of acting as a purgative after it has passed into the bowels. With regard to aromatics, they all possess more or less astringency, and in addition, cause expulsion of the gaseous contents of the stomach. They are volatilized by the heat, and thus are presented to those parts of the stomach and bowels which are distended with gas, and which are only accessible to æriform stimulants. The action of the alkalies usually employed, with the exception of lime, is little more than the neutralization of the acid secretion which is already in the stomach, and hence the effect of them in this disease is little more than temporary.

It is remarkable that the composition of the celebrated Mithridate, which contained about one hundred and fifty ingredients, when analyzed according to their medical properties, exhibits a mixture of astringents, aromatics, alkalies, and opiates. The reputation which it and other similar compounds attained among the ancients as antidotes to poisons arose from the tranquillizing effect produced by them in irritations of the stomach and bowels, and at that time, when metallic poisons were as yet unknown, it became a popular notion that the King of Pontus had so fortified himself against poisons, by the daily use of it, that he was *poison proof*, and when he wished to commit suicide he was forced to resort to his sword.

EIGHTH PROPOSITION.—*A consideration of the nature of the affection, and of the adjuvantia and lædentia, has led to the use of opium in minute doses taken before each meal, which, if the activity of the bowels is duly maintained, rarely, if ever, fails in removing the irritation and all its consequences, unless ulcers have already formed, in which case the same mode of administering the same medicine affords the utmost relief which can be obtained in the disease.*

The essence of the affection consisting in irritation of the gastric glands, a disease which has remained in obscurity, although irritation of the mucous membrane has been long since well known, and its symptoms well ascertained, it might be expected, *a priori*, that remedies useful in appeasing irritations of secreting organs elsewhere should be also applicable here. Having tried opium in small doses, unaccompanied by any other remedies, I was astonished at the effect produced; the sourness and distention in slight cases disappeared at once, and in the refractory instances in which it was evident that scirrhus ulceration had taken place, the improvement was in every respect beyond that which the other modes of treatment were able to produce.

It will be recollected that Dr. Granville gave hydrocyanic acid in some cases of dyspepsia. Not having this work at hand I am unable to judge of the precise nature of his cases; but I am prepared to state that it is very transient in its effects, probably arising from its rapid decomposition in the stomach, and that with me it has failed in this disease, although I have seen considerable benefit from it in cases of irritation of the mucous membrane.

NINTH PROPOSITION.—*Opium, in the dose of six or eight drops of the tincture, appears to act only topically in this case, and does not add to the torpidity of the bowels.*

The small dose of opium now mentioned, taken about half an hour before eating, and when the stomach is empty, first produces its sedative action on the irritable glands, and then being subjected to the digestive process along with the food, appears to be deprived of its narcotic power before it passes into the intestines. We frequently find more effect from opium given in form of enema than when taken into the stomach; a fact which is to be ascribed to its being digested in the latter case, and not in the former. It is true that the small doses of opium given in Dover's powder, checks the action of the bowels; but this effect may arise, first, from the ipecacuan producing an inverted peristaltic action; and, secondly, from the excitement of the skin which usually follows the use of this compound.

TENTH PROPOSITION.—*The diet must consist of eggs, or of meat without fat, both underdone, and the latter not fresh killed. The meals to be taken at intervals of six hours with due mastication, and to consist as strictly as possible of only one article.*

The above is the regimen best for the patient, although it may be difficult to secure his obedience thereto. Animal food

is always found to excite those glands least ; although it excites the mucous membrane most when that surface is the seat of disease. Mastication is an important preliminary to good digestion, and is very imperfectly performed by persons who have contracted a habit of quick eating. Careful mastication also has the desirable effect of causing the appetite to be appeased with a smaller quantity of food. Restricting each meal to one article must be understood as an endeavour to confine the appetite to its natural standard, which is measured by the quantity which we desire to eat of any one article without any admixture whatever. Now in all our meals the arrangements are made so as to induce us to eat too much. Thus the soup is first introduced and the sweets the last, because, if the order was reversed, it would be impossible to accomplish near as much as at present. Even in dining off one dish, the alternate use of bread and meat causes us to swallow more of both than if we were restricted to the separate use of each, and yet the separate use of one is the natural measure of appetite ; and it is to be apprehended that mixtures of any kind in the stomach, even that now mentioned, form a compound more difficult of digestion than either, when presented singly to the digestive process.

ELEVENTH PROPOSITION.—*Certain astringents aid the effect of the opium: in particular, nitrate of silver, rhubarb, and hops.*

The following cases are specimens of the effects of the above-mentioned:—

Mary White, aged 28, 14th December. Sour vomiting occurring about twenty minutes after eating ; pain in region of stomach ; appetite rather impaired ; tongue natural, but with some bright red papillæ. No thirst ; bowels and catamenia reported regular ; fulness perceived in region of cæcum ; no tenderness. Present complaint commenced about two months ago. The camphorated senna mixture *ad effectum*.

15th.—℞. Tinct. opii ʒi.

Spirit. ammon. aromat. ʒiij.

Tinct. rhei ʒss. ℥.

Twenty-four drops to be taken in water half an hour before each meal.

17th. No vomiting; pain in the eye-balls and forehead.

Pil. colocynth. et hydrarg. ij. statim.

Two leeches to be applied to the schneiderian membrane; the drops to be continued.

18th. Head relieved; continue the drops.

20th. Vomiting has not returned; pain has ceased; appetite reviving. Dismissed free from complaint.

Jane Waters, a widow, aged 50, admitted to Sir Patrick Dun's, 4th December, with pain in the region of the liver, and a sense of weight falling from the right hypochondrium when she lay on the left side. She had been ill four years, but had been relieved occasionally by mercurial frictions. In addition to the hepatic symptoms, she laboured under painful distention and sourness of the stomach after eating. She was cupped over the region of the liver, and treated with pills of mass. pil. hydrarg. ipecacuan. and extract of gentian, along with frequent administration of purgatives and warm baths.

On the 17th, the symptoms connected with her liver had completely subsided, with the exception of a dull pain under the ribs at the right side; yet the sourness and distention continued, and had rather increased in proportion as the gradual restoration of appetite caused her to eat a larger portion of food. She was ordered to take the following drops:

℞. Tinct. opii ʒij.

Tinct. humuli, Tinct. rhei, utriusque, ʒiij. ℥.

Sumat guttas xvj. in aquæ cyatho ter in die ante cibum.

The camphorated senna mixture was also directed to be continued as occasion should require. On the 19th, it was reported that the sourness and distention were much better: and

on the 20th, she was dismissed free from complaint, except the dull pain in the region of the liver, for which the application of the emplastr. ammon. cum hydrarg. was directed.

In the following protracted case I wish particularly to direct the attention of the reader to the benefit derived from the opiate after the astringents had failed.

John Lyons, aged 23, a labourer, admitted into Sir P. Dun's, the 1st of February. Pain in region of the stomach; food vomited three hours after eating, with a sour and bitter taste; thirst; tongue coated; pulse 104, small; bowels habitually confined, no motion the last six days; has been similarly affected since about a year ago. Various purgatives were given in the first instance, the dejections were black.

11th. Sour vomiting yesterday, especially when lying on the right side; pain in the right hypochondrium.

℞. Nitrat. argenti grana iv
Aquæ distillat. ℥viij.
℥. Sumr. ℥ss. omni hora.

12th. Some sour vomiting last night; no thirst this morning. States, that he had vomiting resembling coffee grounds three weeks ago, and that he vomited blood about the same time; describes a lancinating and burning pain at the pit of the stomach; states, that he feels thirst before the retching comes on. To take turpentine draught with croton oil; continue the solution.

13th. Pain and vomiting relieved; he is a smoker, and experiences relief from the pain when he swallows the smoke.

℞. Oxyd. bismuth. gr. viij.
Pulv. tragacanth. comp. ʒj.
℥. Ft. pulvis ter in die sumendus.

15th. Sour vomiting during the night, especially when lying on the right side.

℞. Ext. opii aquos. gr. $\frac{1}{4}$.
Ext. humuli grana iij.
℥. Ft. pil. ter in die sumend. : omittr. cætera.

16th. Burning sensation and distention gone; no return of vomiting.

Alvus tarda. contr. pil.

22nd. No return of vomiting or of sour eructations; bowels require the constant use of purgatives.

℞. Ext. aloes aq.

Ext. colocynth. comp. utriusque gr. iv.

℥. Ft. pil. ij. alternis noctibus sumendæ.

Contr. pil. ex ext. opii et humuli.

23rd. Deject. iij.

25th. Sour vomiting; to take a dessert spoonful of fresh burned crust occasionally.

Contr. cæt.

26th. Vomiting has not recurred; heartburn. Two grains of dried soda to be added to the sedative pills.

Contr. pil. aloes alterni noct.

9th March. Aperient pills now operate only twice; heartburn and vomiting have not recurred.

12th. Complains of constant heartburn.

℞. Liq. pot. caust. gutt. xx.

Muc. gum. arab. aquæ menth. utriusque ℥ss.

℥. Ft. haustus statim sumendus; contr. pil.

16th. Heartburn relieved only immediately after taking the draught.

℞. Tinct. opii gutt. x.

Tinct. humuli ℥ij.

Liq. pot. caust. gutt. xx.

Aquæ menth. p. ℥i.

℥. Ft. haustus ter in die sumendus.

19th. Feels quite relieved.

Omittr. pil. Contr. haust.

23rd. No return of vomiting, heartburn, or of distention.

Pergat.

25th. Dismissed free from complaint.

The preceding case is one in which there was sufficient evidence of an ulcer in the stomach. In the following there was a distended stomach, and probably a contracted state at the centre of the great curvature, which divided the cardiac end from the rest, forming a separate pouch; a consequence of which was, that the patient always vomited, not the last meal, but the one before the last, and this without any admixture of the two. This case, and the preceding, are adduced here, in order to shew the effect of the opiate treatment, in cases of undoubted scirrhus and cancer. On perusing Dr. Automarchi's work on the last illness of Buonaparte, it does not appear, that this course of treatment was ever adopted, and that illustrious patient experienced so little relief from the calomel and purgatives, which were almost the only medicines given at the commencement of his disease, that he became unwilling to take any remedies in the advanced stages. I might here bring forward a number of cases to prove the effects of the opiate treatment in slight cases, but prefer, for the sake of brevity, to relate those in which organic changes, consequent on irritation of the gastric glands, had evidently taken place, and from which its effects may *a fortiori* be deduced.

James Judge, aged 40, October 21st. Pain, tenderness, and obscure fulness in the right epigastrium; sour vomiting about two hours after eating, sometimes sooner. He states, that on these occasions the matter vomited is never the meal last taken, but that previous to the last; vomiting and pain produced by lying on the right side; occasional pyrosis; flatulence; thirst; no bad taste; pulse nearly natural; generally vomits after breakfast: if before, then no return of vomiting takes place during the day; potatoes and cabbage in a particular manner cause distention and vomiting; has vomited matter resembling coffee grounds; duration of his complaint eight years.

Pil. colocynth. et hyd. ij. 3tiis horis ad effectum. Enema tereb.

23rd. Four dejections after six pills.

℞. Tinct. opii ℥ij.

Tinct. humuli. Sp. ammon. foetid. utriusque ℥iij.

℥. Sumr. gutt. xxiv. ante cibum ter in die.

Vesm. epigastrio.

26th. Food is now retained on his stomach. When lying on his left side he hears something dropping into the cardiac portion of his stomach, as if into an empty bottle.

Camphorated senna mixture ; turpentine enema ; continue the drops.

30th. Tenderness at epigastrium.

Hirud. vj. p. d.

31st. Last night, five hours after a supper of bread and milk, he vomited up his dinner of bread and meat.

℞. Aloes, Ext. hiosciam. mastices, singulor. ℥i.

Ext. colocynth. ℥ij.

Olei croton. tiglii. gutt. v.

℥. Ft. pil. xxiv. Sumr. iij. et repr. ad effectum.

Enema tereb. vesp. si opus.

℞. Tinct. opii,

Liq. potass. caust. utriusque ℥ij.

Tinct. humuli ℥ss.

℥. Sumr. guttas lx. ter in die.

6th. Pills do not operate without the aid of the enema or senna mixture ; no vomiting ; sour eructations ; appetite good.

Vesicat. epigastrio. Continue the drops.

29th. No vomiting ; appetite good, feels much better ; requires the senna mixture frequently.

December 3rd. Vomiting occurred last night ; with this exception, has been nearly free from complaint.

℞. Tinct. opii ℥ij,

— Humuli,

— Rhei, utriusque ℥iij.

℥. Sumr. gutt. xxiv. ante cibum ter in die.

Enema ex aquæ lib. v.

7th. Feels now free from all uneasiness; bowels still habitually costive. Dismissed.

The extract of conium in several instances in which I tried it, although productive of alleviation of pain, yet did not equal opium in either the extent or permanency of its effect. Hence, although I find the use of opiates mentioned by Dr. Abercrombie and others, amongst the remedies proper for painful affections of the stomach, yet according to my views, they have not gone far enough, and I desire to be understood as bringing it forward as the most important remedy which we possess, both for appeasing the irritation of the gastric glands, and for obviating its destructive consequences.

TWELFTH PROPOSITION.—*The permanent activity of the bowels is to be promoted by the administration of watery extract of aloes, and other nauseous bitter purgatives, taken at night; by early rising; walking or other active exercises in the open air; cheerful occupations, and the establishment of a habit of regular evacuation of the bowels.*

There is an advantage in taking aloetic purgatives at night; as they are usually twelve hours in arriving at the cæcum, the time of their operation will come on soon after breakfast, when everything should be made to conspire in aid of their effect. Early rising with some persons in health produces a slight diarrhoea, while a continuance in bed is well known to lead to a torpid action of the bowels. The other circumstances above mentioned, as contributing to the same end, are, in the management of every case, to be constantly kept in view. The establishment of a habit has been justly insisted on by a very high authority. It is matter of general observation, that by habit an appetite may be created at any hour in the day; by habit the bladder may be induced to contract, and require to be evacuated much oftener than previously, and by habit the bowels

can be brought to a regular action in the great majority of ordinary cases of torpidity.

The establishment of issues and other counter-irritations over the pyloric region of the stomach, is often attended with manifest benefit. As it is, however, in mixed cases, in which the disease now before us has been followed by inflammation of the mucous membrane, that this treatment is most applicable, we have not noticed it at present.

THIRTEENTH PROPOSITION.—*When in a case of sour vomitings and eructations, a vomiting of matter resembling coffee grounds occurs, it denotes that ulceration has taken place. This is also usually attended by pain and vomiting, produced by the patient lying on his right side, by thirst and other symptoms belonging to inflammation of the mucous membrane.*

In all my cases of this disease, in which vomiting of dark or reddish powder, in fluid, resembling coffee grounds, occurred, and in which an examination after death has been recorded, I find ulceration had taken place. One of those cases was that of Mr. P. already cited. The last was that of Robert Allen, admitted into Sir P. Dun's, 25th April, 1835, with the following symptoms: vomiting about three hours after taking food, at first sour, subsequently bitter; within the last week anorexia; tongue white, and rather dry; thirst; has had vomiting of matter resembling coffee grounds; also passes dejections of similar matter; inflation of stomach; meat or porridge has agreed well, but not potatoes or cabbage; is lately frequently annoyed by hiccup; no emaciation; complaint commenced three years ago; vomiting of coffee grounds matter first occurred a year and half ago.

It is unnecessary to detail the particulars of this case: the hiccup and vomiting had subsided, and some return of appetite had taken place, when he suddenly became maniacal, refused to take either food or medicines, and required the application

of the stomach tube. He sank and died on the 20th of May. A hurried examination was obtained at his own dwelling. Two ulcers, each nearly the size of a half crown, were found on the lesser curvature, one near the cardiac, and the other near the pyloric orifice. They had penetrated through all the coats, and bursting forth of the contents of the stomach had been prevented only by adhesions to the adjacent parts. There were smaller ulcers near the pylorus below the lesser curvature, apparently of recent date. The remainder of the stomach was nearly healthy. I have one case in my collection, in which, although the pyloric end of the stomach was much thickened, there was no ulceration found after death, and yet in one of the daily reports, there was an entry of coffee ground vomiting. In a subsequent report, however, it is stated, that the patient was a tobacco smoker, and that this appearance in the matter vomited had occurred in consequence of swallowing the saliva, and had never taken place on any other occasion. On examining the stomach, we not unfrequently see numerous black streaks involved in the mucus. The appearance of these in the matter vomited must not be confounded with the peculiar fluid which we designate by the term coffee ground vomiting, as probably was done in the above mentioned report.

Neither must vomiting of blood, or of bloody mucus, be taken as an indication of ulceration. The former may proceed from rupture of a vessel, and the latter is a secretion which I have seen in mælena, with a thick and pulpy state of the mucous membrane, filling the entire digestive tube from the stomach to the rectum, both inclusive, and apparently poured forth from every part of that mucous surface. Some cases also are recorded of the latter coming on vicariously to the catamenia.

The following case is an instance in which ulceration of the stomach extended into the liver, and hæmorrhage took place, producing vomiting of blood *sometimes coagulated*, and black dejections resembling those in mælena.

Jane Kelly, aged 40, admitted 8th December. Pain in

right hypochondrium ; vomiting of blood sometimes coagulated ; dejections black ; pulse eighty-eight, feeble ; tongue white ; duration of hæmatemesis eight days, of black dejections the same time, of pain two months ; has had sour vomiting. For some time the hæmorrhage was restrained, and the vomiting had ceased, when on the 17th it recurred with increased violence. It again ceased on the 21st, but in a few days she appeared evidently sinking, and died on the 3rd of January. On examination after death, there were two hard jagged ulcers, one connected with the pancreas, the other with the liver, both at a distance of about one inch and half from the pylorus, and situated near the lesser curvature. That which was connected with the liver extended into the substance of that organ, and by the adhesions which had formed, drew up the greater curvature, so as to form a pouch or supplementary stomach towards the pylorus, capable of containing about four ounces. The pylorus itself, and the rest of the stomach, with the intestines, were natural, and rather paler than usual. Black fluid, like that discharged during life, was found in the duodenum, and throughout the whole tract.

Dr. Abercrombie however mentions, that he has seen fatal vomiting of blood where no organic disease could be discovered, and even the source of the hæmorrhage could not be detected. This is additional evidence, that vomiting of blood, taken by itself, furnishes no proof of ulceration, while that of matter resembling coffee grounds is (as far as my experience has extended) an indication on which reliance may be placed. As a circumstance corroborative of this latter statement, I now subjoin two cases, which although severe and ultimately fatal, yet were without ulceration ; and in these there was no vomiting resembling coffee grounds.

Peter Magill, aged 52, admitted to Sir Patrick Dun's, February 21st. Vomiting of food generally within two hours after eating, except the quantity taken is very small ; pyrosis usually every morning ; bowels torpid ; emaciation ; occasional

thirst; no hardness to be felt in any part of the abdomen; has never vomited any matter resembling coffee grounds; duration of present symptoms four months. The treatment of this and other cases is omitted, not being that which an enlarged experience has convinced me to be the best. He died after a residence of above two months in the hospital. On examination, the stomach was enormously distended, and its coats greatly thickened and indurated, especially at the pyloric end, from which the thickening gradually decreased to the cardia. There was no ulceration.

William Mills, a schoolmaster, aged 20. Tumour in right hypochondrium, extending downwards, hard and painful on pressure; vomiting of extremely acid fluid, produced by taking potatoes; heartburn generally severe: occasional vomiting of transparent sour fluid, with froth like barm on the surface when he has not taken food; emaciation; appetite continues, but is diminished when his bowels are costive; pulse ninety; after eating he perceives a pain in his left shoulder; tongue nearly natural; lying on his right side produces sour eructations; duration of present complaint about four years; is reported to be of temperate habits. He came under my care three several times in Sir Patrick Dun's, and was on those occasions dismissed much relieved. He was admitted the fourth time, labouring under a severe dysentery, from the effects of which he died.

Dissection.—Emaciation extreme; right lobe of the liver extended downwards to the anterior superior spine of the ileum; the left lobe not enlarged; the substance of a reddish colour, soft texture, and consisting of the *acini* in a state of hypertrophy. Pyloric extremity of stomach adherent to it, both by bands of old formation stretching across, and by a firmer and closer connexion, such as occurs when ulceration is found extending from the stomach into the liver. The coats of the stomach towards the pylorus, hard, and thickened, except the mucous membrane, which was pale and rather thin; duodenum

healthy: tract between cæcum and rectum, with a thin coating of lymph, the villi being of a bright red underneath; mesenteric glands enlarged; small tubercular cavities at the apices of the lungs, and groups of tubercles in some parts of them towards the base. The heart very small, the cavities remarkably contracted, and containing no coagula: valves healthy.

During the long-protracted sufferings of this individual, he never vomited the matter resembling coffee grounds.

An ulcer (except in some cases when in the lesser curvature) gives rise to certain symptoms different from those belonging to irritation of the gastric glands, or the scirrhus consequent thereto. Thirst is now perceived, and becomes rather a prominent symptom. Lying in a direction in which the contents of the stomach may come in contact with the ulcer, causes irritation, pain, or vomiting. Meat and spiced articles of diet, which before were productive of the least inconvenience, now cause increased uneasiness, and the food must, with a few exceptions, be restricted to vegetable substances or eggs. Persons in this state, in whom the irritation of the gastric glands has been appeased by treatment, may take stirabout, and if it does not produce sourness its use is attended with many advantages. Eggs beaten up, broth without salt, gelatinous articles, as sheep's trotters, boiled soft, are to be mentioned as specimens of the kind of diet which may be permitted with the least risk of injuring the state of the ulcer. In this predicament, it becomes indispensable to act on the bowels by enemata as much as possible, as the presence of purgatives in the stomach for any time, however short, is injurious. With regard to remedies, in addition to the opiates, I have to recommend the solution of the nitrate of silver: the benefit derived from which is analagous with its well known effects when applied to inflammations in different stages on the surface of the body.

On the next opportunity I hope to be able to bring forward my propositions on affections of the mucous membrane of the stomach.

ART. XXII.—*A Case of Laryngitis*. By DAVID HASTINGS MAC ADAM, M. D., one of the Physicians of the City of Dublin Hospital, and of the South-eastern General Dispensary.

[Read before the Surgical Society of Ireland.]

A CASE of laryngitis lately came under my care in the City of Dublin Hospital, in which the operation of tracheotomy was performed with temporary good effects ; and, as it presented many interesting features, both as illustrative of the pathology of the larynx, and of the advantages of the operation, I am induced to submit it to the attention of the Society. I feel the importance of having individual cases, which have been faithfully recorded, and which have had their diagnosis confirmed by dissection, brought before the attention of the medical public ; every such instance contributes either to increase or confirm our knowledge of disease, and, perhaps, little more is necessary on the part of the narrator than truth in his statements and accuracy in his descriptions. Without further preface, then, I shall give you a history of the case, and of the morbid appearances which were revealed by dissection, together with a few remarks which have suggested themselves to me from a review of the phenomena which the patient exhibited while under my observation. It appears to me that, though the case terminated fatally, yet, fairly considered, it affords evidence of the value of the operation, and also that the post mortem appearances throw some light on the *immediate cause* of death in laryngitis, when it occurs some time after the operation of tracheotomy, and may consequently suggest some useful hints in the treatment of patients under such circumstances.

Christopher Nowlan was admitted into the City of Dublin Hospital on the 16th of March, 1835. He was a labourer, of a sanguine temperament and spare habit. He states that he never

had any venereal affection, and always enjoyed good health until about seven weeks ago, when he became attacked with fever, for which he was admitted into Sir Patrick Dun's Hospital, where he remained six weeks. On the decline of the fever, which lasted three weeks, he became affected with cough and sore throat, but unattended with any sonorous respiration. He left the hospital, the cough and sore throat still continuing, though probably slight in degree, and attended the South-eastern Dispensary, where he used an acid gargle. His symptoms remained without any remarkable alteration until the night of the 15th of March, when he became attacked with an aggravation of the cough, accompanied with sonorous respiration and great dyspnœa, which obliged him to sit up in bed all night. On the 16th, he presented the following symptoms. Respirations 20, laborious and interrupted; inspirations loud, shrill, and crowing, somewhat resembling the whoop in pertussis, but more harsh and dissonant; expiration not so difficult, but accompanied with a rattling stertorous sound, evidently proceeding from the larynx; occasional hoarse barking cough; the dyspnœa is much aggravated by the recumbent posture. When the stethoscope is placed on the larynx, a loud, harsh, crowing sound is heard, extremely grating to the ear; the chest sounds natural on percussion, both anteriorly and posteriorly, and the loud laryngeal sounds, re-echoing through the thorax, prevent any respiratory murmur or other sounds from being distinguishable; there is some sonorous rale, however, audible in the posterior part of the chest though nearly drowned by the laryngeal sounds. He complains of soreness when pressure is made on the alæ of the thyroid cartilage, which also excites a fit of coughing. There is no aphonia, his voice, though extremely hoarse, can be heard at some distance distinctly. Pulse 108, soft and compressible; tongue clean; there is some slight redness of the fauces without tumefaction; face slightly flushed, bowels confined.

The dyspnœa and sonorous respiration, with the other

symptoms, continued without any material change until the night of the 17th, when they became much aggravated. I was sent for at half past twelve o'clock on the morning of the 18th, when I found him considerably worse than when I last saw him. Respiration very laborious and interrupted, though not so sonorous as in the preceding morning. He appears to be gasping for breath, and in momentary danger of suffocation. His surface is warm; pulse frequent and of tolerable strength. Under those circumstances I sent for my colleagues, Drs. Benson and Houston, in order to consult them on the propriety of the operation of tracheotomy. At half past one o'clock he appeared to be sinking; his face was pale and cadaverous, moistened with a cold clammy perspiration; the surface of the body, especially the lower extremities, were cold; respiration more laborious and slower, accompanied with strong heaving of the chest, and violent action of the thoracic muscles. He eagerly grasped the hands of the by-standers, as if to assist in enabling him to expand the chest; his pulse was small and thready. Under those circumstances we came to the unanimous conclusion, that tracheotomy afforded the only chance of saving the patient's life. He was accordingly laid on his back for the purpose of performing the operation; at this time he appeared in the act of dying; his pulse almost imperceptible, and his respiration became suspended for nearly half a minute. The operation was performed by Dr. Benson, with a rapidity suited to the urgency of the case. The Doctor states, that the neck was one of the shortest he had ever seen, so that the external incision, though extending from the thyroid cartilage to the top of the sternum, did not exceed three inches in length. By a few strokes of the scalpel the trachea was laid bare, between the sterno-hyoid and sterno-thyroid muscles, and, on removing the sponge, its white rings could be distinguished just below the transverse slip of the thyroid gland, which was very narrow and thin. All the muscles seemed greatly developed; the sterno-mastoids especially stood out so prominently, as to throw

the trachea to the bottom of a very deep cavity, which became filled repeatedly with venous blood, though no vessel of any size could be perceived. To open the air tube with the knife, as intended, at the bottom of such a well of blood would have been extremely hazardous ; to wait till the hæmorrhage could be checked would have been death ; under those circumstances Dr. Benson plunged a large trocar into the trachea, expecting that the canula would so fill its transit as to prevent any blood from getting in ; this had the desired effect, as was evident by the firmness with which the instrument was grasped by the elastic trachea.

On the introduction of the canula into the trachea, a strong inspiration ensued, followed by a violent fit of coughing and dyspnœa, succeeded by the expulsion of a quantity of viscid mucus mixed with blood through the tube ; almost immediately after which, his respiration became comparatively easy, the colour returned to his cheeks, his pulse became more distinct, and his surface warm, and in a short time he was able to speak distinctly, to sit up in his bed, and to take some drink. He had, however, frequent attacks of violent cough and dyspnœa, succeeded by the expulsion of bloody mucus through the tube, followed by nearly natural respiration, which was evidently performed exclusively through the canula, for a lighted candle brought near its orifice was extinguished during expiration ; and when the finger was placed on its extremity, respiration was suspended, and the patient suffered the distressing sensation consequent upon holding the breath.

He continued during the entire day and night of the 18th without much change ; his respiration tolerably easy, unless when the tube became obstructed with viscid mucus, which occurred frequently, and produced great distress and dyspnœa. Mr. Gray and Mr. Meaze, two of the resident pupils, were kept constantly on the watch for the purpose of clearing the tube from time to time with a probe, which duty they performed with the most unremitting attention and care : his

breathing had lost the loud sonorous sound which was so remarkable before the operation, and acquired a sibilous or whistling character, evidently proceeding from the passage of the air through the canula.

On the morning of the 19th he exhibited nearly the same phenomena, with the addition of the establishment of ptyalism, having been taking mercury for the last forty-eight hours. The tube having become loose, it was taken out and a tracheal canula inserted; but this was found to be too short, the muscles lifting it out of the trachea. It was then tried how far the opening in the trachea, which was free and gaping, could be left without a tube; but the muscles, though somewhat compacted together by adhesions, were still capable of slipping over it and completely closing it up: the canula was, therefore, inserted as before, and secured in the usual way. During the entire of this day and the following night, his symptoms continued unchanged, except that he complained of increasing debility; at no time was there a total loss of voice, except for a few minutes, occasionally, when the canula became obstructed with mucus, which sometimes formed hard tenacious masses which were removed with difficulty by the probe. A little before 7 o'clock on the morning of the 20th, he spoke distinctly to Mr. Meaze, and said that if the tube was obstructed he would die: this led to an examination of the canula, which was found quite clear of mucus. A very short time afterwards he expired about $53\frac{1}{2}$ hours after the operation was performed.

We obtained an examination of the body about seven hours after death. The dissection was made by Dr. Benson, and the following were the appearances as described by him:—The muscles being carefully dissected off the larynx anteriorly, the sterno-hyoid and sterno-thyroid were found matted together by coagulable lymph, and could scarcely be distinguished from each other. The tongue, trachea, and lungs were removed together from the body, for the purpose of a more minute examination. The opening made

by the trocar into the trachea was distinct and gaping, and was found situated between the first and second rings, penetrating the lower part of the thyroid gland. On raising this gland a considerable mass of semi-cartilaginous substance was found covering both alæ of the cricoid cartilage; on dividing this substance, an abscess was exposed lying on both sides of the cricoid, which was denuded anteriorly; both alæ appeared sound: this cartilaginous mass occupied the situation of the crico-thyroid muscle. On dividing the pharynx posteriorly, the whole anterior surface of the epiglottis was found elevated by serous effusion into the submucous tissue, appearing like a gelatinous mass between it and the root of the tongue; the effusion extended along the aryteno-epiglottidean folds; the arytenoid cartilages were covered with the same substance, and appeared greatly enlarged and altered in form. On looking down into the larynx the rima appeared completely closed; the ventricles were obliterated by the elevation and thickening of the mucous membrane above and below; the chordæ vocales were thickened and rounded, not presenting a defined edge. The back of the pharynx and trachea being divided between the arytenoid and broadest part of the cricoid, the abscess, which was before seen on the sides of the cricoid anteriorly, was now found to extend all round the posterior part of that cartilage; the same semi-cartilaginous structure was observed in the sac of the abscess posteriorly as anteriorly. This portion of the abscess occupied the place of the posterior crico-arytenoid muscle, its cavity was of a dark greenish colour the size of a bean, and exhaled a gangrenous odour. There was no communication between this abscess and the cavity of the larynx, but it opened into the pharynx, about one inch and a quarter from the tip of the arytenoid cartilage. The cricoid cartilage was partly ossified and extensively carious; all the interior of the trachea was lined throughout by a gelatinous effusion of a reddish colour, appearing in some parts like coagulable lymph, and every where very adhesive; on scraping it away the tracheal mucous

membrane was found softened and highly vascular, presenting a pale appearance in the larynx, but was of a light pink colour at the root of the epiglottis. There was no ulceration detected on any part of the internal surface of the larynx or trachea.

The opening made by the trocar was about an inch and a quarter from the rima glottidis. The same kind of gelatinous fluid that was noticed in the trachea, was found in the right and left bronchus; it presented a like reddish appearance, and completely filled up the right bronchus and its various ramifications to the third and fourth order; the left bronchus contained a similar effusion but in a lesser degree. The lungs appeared for the most part healthy externally, except at their anterior thin edges, which were white, devoid of blood, and partially emphysematous. In the upper lobe of the right lung there were a few detached tubercles, some transparent, some opaque and softened, and others calcareous: the glands at the bifurcation of the bronchiæ were much enlarged, very black, and hard. The heart was smaller than natural, its walls much thickened.

It appears probable, from a consideration of the *post mortem* appearances, that the disease in this case had its commencement in the broad posterior portion of the cricoid cartilage, which became disorganized, partly ossified, and ultimately, as the dissection revealed, extensively carious; an abscess, in consequence, was formed behind this cartilage, which gradually extended round it, and also formed a communication with the pharynx. It is likely that this morbid process had been going on for a considerable time previous to the attack of fever, but being slow in its progress, it might not have been productive of any serious inconvenience, and, consequently, not have attracted the patient's attention sufficiently to have produced any very distinct impression on his memory; he, therefore, gave no account of any symptoms indicative of laryngeal affection previous to the attack of fever. At this period, the case may be considered as an example of phthisis laryngea, presenting that form of the disease described by Mr. Porter, in his valuable work on the

larynx, as "abscess complicated with disorganization of one of the laryngeal cartilages." In this state the patient became affected with fever, but it is most likely, that previous to this attack, the morbid action that had been for some time established in the cartilage had extended to the laryngeal mucous membrane, as Mr. Porter informs us, that "long before the formation of abscess, and whilst the morbid change seems to be only commencing in the cartilage, the mucous membrane begins to suffer." As local inflammations are not unfrequently excited during the course, and towards the termination of fevers, it was most probable, *à priori*, that the larynx would become affected in this case, as a predisposition to, or an actual commencement of inflammatory action existed in this organ previous to the febrile attack. The case then, when it first came under my observation, was an example of acute laryngitis, occurring in a patient previously affected with chronic disease of the larynx, which acute affection was probably induced by the fever. In this state he first presented himself to me at the South-eastern Dispensary; from the symptoms which he then exhibited, it appeared to me, that general bleeding would have been useless or injurious. The patient was debilitated by a previous severe attack of fever, and the evidence of mechanical obstruction in the larynx was so decided, that I felt convinced, that venesection, even if it could be practised to a large extent, would have no effect in removing the cause of the dyspnoea, and would only lessen his chance of recovery, by diminishing his strength. The same objections, though in a less degree, seemed to exist against local depletion; and it appeared to me, that the employment of mercury and counter-irritation were the most efficient means I could use, and that the operation of tracheotomy, in all probability, would in a short time be necessary to save the patient's life. I accordingly ordered him calomel, combined with hippo, antimonial powder, and opium, a blister to be applied to his larynx, some aperient medicine, and gave him a recommendation for admission into the City of Dublin Hospital. Unfor-

tunately, however, owing to some mistake on his part, he did not commence the medicine till next day, the morning of the 17th, when I saw him at the hospital, in consultation along with my colleague Dr. Benson. We both determined then to continue the use of the mercury, and though we thought it highly probable we would be obliged to have recourse to the operation before the next twenty-four hours, yet we considered it expedient to defer it until the symptoms became more urgent, and in the meantime to give the patient a chance with the mercury.

At the time the operation was performed, the man would in all probability have expired, if it had been delayed a single minute. He, in fact, had ceased to respire previous to the introduction of the canula, so that some of the pupils present said he was dead. The immediate result of the operation was most gratifying, and I have seldom witnessed a case so calculated to impress an unprofessional beholder with the vast value of well-directed surgical skill, in the preservation of human life. The spectacle of a patient apparently dead, without breath, or warmth, or pulse, suddenly restored by an operation, which scarcely took a minute to perform, to life, and heat, and consciousness, able in a few moments to sit up in bed, to speak, and take some drink, afforded a striking instance of how dependant (humanly speaking) our fellow men occasionally are for their very existence on the aid which our profession can afford; and though the patient ultimately died, yet I think I am justified in the conclusion, that the case was a proof of the great value of the operation, as his life was evidently protracted fifty-three hours under the unfavourable circumstances of a constitution previously debilitated by a severe fever, the co-existence of extensive organic disease of the larynx, and intense bronchitis.

Immediately after the operation, small doses of carbonate of ammonia, in camphor mixture, were occasionally exhibited, which appeared to have the effect of reviving the patient, and restoring warmth to the surface, especially the extremities; the

calomel was continued in the form before mentioned, and some strong mercurial ointment was directed to be rubbed into the axilla ; a mixture of a solution of carbonate of potash, with some hippo wine and syrup, was also ordered, with a view of diminishing the viscosity of the expectoration, thereby favouring its expulsion, and lessening the chance of its concreting in the tube, an effect which I have occasionally seen alkaline solutions produce in those cases of bronchitis where the sputa are remarkably viscid and tenacious. The patient was fully salivated twenty-four hours before his death, so that the mercury got a fair trial. It becomes then an interesting subject of inquiry, what was the immediate cause of the patient's death. He evidently did not die in consequence of obstruction of the tube, for it had been ascertained to be pervious almost the moment before he expired ; neither do I think we are justified in concluding, that the fatal result was entirely owing to gradual depravation of the blood, in consequence of imperfect oxydation ; in such cases the patient dies in consequence of the deleterious influence produced on the brain by the impure blood, but our patient presented no symptoms immediately before his decease, to justify the conclusion, that he died in consequence of the operation of this cause : a consideration of the *post mortem* appearances explains, I think, the immediate cause of the patient's death. The right bronchus was completely plugged up, and the left nearly so, with a gelatinous effusion, which also lined all the interior of the trachea, proving, that intense bronchitis had existed, and rendering it evident, that the immediate cause of death was obstruction of the bronchial tubes, the consequence of effusion produced by inflammation of their lining membrane. While the patient retained sufficient strength to perform the respiratory efforts necessary to overcome this obstruction, and to expel a portion of the viscid mucus, enough of air was inspired to preserve life ; this, however, was progressively diminishing, according as the effusion increased, and the patient's strength declined. The circulation also became gra-

dually depraved, in consequence of the less perfect oxydation of the blood; another debilitating cause arising from this source was added to the exhaustion consequent upon long-continued laborious respiration, and the patient sunk when his powers ceased to be equal to those combined debilitating influences. I am led to the conclusion then, that bronchitis and its consequences were the immediate cause of our patient's death, and it appears to me not improbable, that if we had ascertained the existence of the bronchial inflammation the day subsequent to the operation, the patient's life might have been, at least, protracted to a longer period by local depletion, blisters to the top of the sternum, and the exhibition of small doses of antimonial solution, as he certainly retained strength enough to bear the cautious employment of these remedies. But it was extremely difficult to explore the state of the lungs by stethoscopic examination in this case, the noise caused by the laryngeal sounds rendered it almost impossible to distinguish any respiratory sound in the anterior parts of the chest, and the cough, expectoration, dyspnœa, and other symptoms were equivocal, as they might equally be considered as arising from the laryngeal affection, and from the irritation of the tube in the trachea. I am disposed however to conclude, from a consideration of this case, that bronchitis is not unfrequently the cause of death when it occurs some time after the operation of tracheotomy, and that, consequently, when the patient's strength permitted, it might in some instances give him an additional chance of life, if he were subjected to a treatment calculated to remove bronchial inflammation. If I should meet with another case similar to the one I have been just considering, I would be disposed, very soon after the operation, to apply leeches to the upper part of the sternum, followed by a blister, and to put in practice the general treatment suitable to acute bronchitis, as far as circumstances permitted. In this case, the patient would probably have ultimately died, even if the bronchitis had been subdued. The extensive disease of the cricoid cartilage, and the

abscess in its vicinity, the sac of which appeared already becoming gangrenous, would probably have led to mortification of the cartilage and an opening between the abscess and the cavity of the larynx, and the patient would have died after having exhibited all the phenomena of phthisis laryngea. But in more favourable cases, it is not improbable, that if the bronchial inflammation, which exists after the operation, were subdued in time, it might be the means of preserving the patient's life, and could scarcely in any instance, where the practice was applicable, be productive of any bad consequences.

BIBLIOGRAPHIC NOTICES.

An Exposition of the Nature, Treatment, and Prevention of continued Fever. By HENRY M'CORMAC, M. D.

No country in Europe affords a more abundant supply of fevers for the study of the physician, than Ireland;—specimens of this disease are always to be met with both among the inhabitants of the city, and the rural population, and every few years a new epidemic still further varies and extends the opportunities for observation. The prevalence of fever in Ireland has naturally induced the practitioners of this part of the united kingdom to pay more than ordinary attention to the symptoms and treatment of this endemic malady, and has been the means of causing many and skilful physicians to publish the results of their study and of their experience. Besides the various excellent essays by provincial physicians contained in the elaborate work of Barker and Cheyne, a work of classical reputation, and an excellent model for every one who wishes to write a history of an epidemic, we can boast of many valuable contributions to this important department of medicine, and of many authors whose names confer a dignity on the profession and credit upon the country. It is, perhaps, invidious to mention particular names, where so many deserve notice; we may be allowed, however, to gratify ourselves by referring to those of Cheyne, Barker, John Crampton, O'Brien, Grattan, and Marsh, who have all contributed important materials towards the elucidation of this obscure and difficult subject. If we were asked to point out something peculiarly characteristic of the Irish school, we should say that it consists in a total absence of all theory, and an attentive study of symptoms and the best method of treatment; among our neighbours we have gotten, and perhaps have earned, the character of a people who are more fitted for works requiring imagination, than for those which demand cool judgment and steady perseverance. In other departments of literature this may be true, but it is not so in medicine, for it may be with safety asserted, that no

nation is so little given to quackery as the Irish, and no body of medical men so adverse to all speculative and useless theories as those which compose the medical profession both in Dublin and the provinces. Scotland boasts herself the mother of the theories which led to the destructive doctrines and practice of Brown, and she likewise claims the merit of the Hamiltonian system of purgatives, and of the treatment which originated in the peculiar views of Cullen, with respect to the nature of fever. England can bring forward many competitors for fame, most of whom, in views and theories however different from each other, in other respects agreed, recommending the bold use of the lancet and calomel, and denying the existence of fever, except so far as it is a consequence of inflammation. In Ireland, on the contrary, no particular doctrine or theory ever seemed to have misled the profession into the adoption of remedies; so that while the English and Scotch wrote for the purpose of supporting theories, the Irish studied and observed with the sole object of discovering the most appropriate method of treatment. And what have been the results? We hesitate not to affirm, that they are such as are by no means flattering to the advocate of theories and systems; we hesitate not to say, that in no country in Europe is the treatment of fever so well understood as in Ireland, and in no country does medical science achieve such wonderful victories over this formidable antagonist. Ireland, we say it with pride, is not a country for charlatans; some our soil produces, but they can find no employment at home, and are forced to expatriate themselves for the purpose of acquiring wealth by their impostures. Our quacks are indeed the first of their profession, and in comparison with them, the stupid English pretender sinks into merited insignificance. In proof of the truth of this assertion we might refer to London, Cheltenham, and Leamington, in each of which an Hibernian rules with undisputed sway; now and then some feeble attempt is made by means of *veratrine*, *chlorine*, *colchicum*, or some such agent, to drive the Irish from their ground of vantage; but vain is the effort, useless the struggle of a hundred Turnbills, Scudamores, and Solymans, against the triumvirs St. John Long, Ramadge, and Jephson. In proof of the assertion that the Irish, in medical matters at least, are by no means credulous, it may be observed, that *Animal magnetism*, which had so many admirers on the continent and in England, and was beaten out of the French capital but by the united forces of the most distinguished Parisian literati, was at once rejected by our countrymen; even *Phrenology*, a mild and feminine science, scarcely found in Ireland where to lay her head; and *Homoioopathy* quickly turned

her steps from our shores, not however before one voice had been lifted up in her favour ; but that voice, although speaking many languages, polyglott beyond the gift of tongues, and the fruitful parent of false derivations innumerable, soon died away unheeded.

Time it were, however, to introduce Dr. M'Cormac to the notice of our readers. His work consists of 202 very closely printed octavo pages, and is written in so condensed a style as to defy all attempts at analysis ; we are limited, therefore, to the selection of a passage from that part of the book which is devoted to general considerations concerning the nature of fever.

“One of the greatest obstacles to the improvement of pathology at present, is, perhaps, the spirit of pathology itself. We occasionally forget that disease is an act of our organization, and regard the mere results or accompaniments, as an explanation of disease itself. These organic changes, for to such do I allude, are very interesting, as part of the phenomena of diseased action ; but to look at all disease through the medium of visible organic changes, is, doubtless, highly erroneous.* I conceive that the improvement of this branch of science will be best effected by the steady observation and careful analysis of the various healthy and diseased functions, on the aggregate of which we bestow the term life ; a term, however, as I have shewn below, almost as variously defined, as there have been found persons willing to attempt its definition.† Let this be done

“ * On this point Holland has judiciously observed—‘ One of the most striking errors of pathological works, is the almost exclusive attention that is paid in them to the examination of organs, primarily and chiefly diseased, to the utter neglect of the consideration of the various effects they produce, which frequently convert a local into a general affection.’—*Inquiry into the Principles and Practice of Medicine*, vol. i. p. 74.”

“ † Like other complex terms, life can obviously be defined only by an enumeration of the phenomena which it associates. See Henry on the Physiology of the Nervous System : p. 59, of the third Report of the British Association for the Advancement of Science.—Un corps vivant, considéré comme un objet des recherches chimiques est un laboratoire, dans lequel s’accomplissent une foule d’opérations chimiques, dont le résultat définitif est, d’une part de produire tous les phénomènes dont l’ensemble constitue ce que nous appelons la *vie*.—Berzelius, *Traité de Chimie*, Paris, 1831, tome v. *Chimie Organique*, p. 1. Esslinger’s Translation. Alles Leben besteht also in beständigen Zersetzungen und Zusammensetzungen ; alles Lebendige ist ein unaufhörlich erlöschendes, und unaufhörlich sich wieder entzündendes Meteor.—Treviranus, *Biologie*, Gottingen, 1805, Dritter Band, p. 591. Si pour nous faire une idée juste de l’essence de la vie, nous nous apercevons qu’elle consiste dans la faculté qu’ont certaines combinaisons corporelles de durer pendant un temps et sous une forme déterminée, en attirant sans cesse dans leur composition une partie des substances environnantes, et en rendant aux élémens des portions de leur propre substance.—Cuvier, *Règne Animale*, Paris, 1817, tome i. p. 12, 13. *Vita nihil aliud est formaliter, quam*

over and over, by different observers, with a careful attention to the terminology, by which so many disputes and misconceptions would be obviated, and, doubtless, we shall in due time witness a gradual but steady improvement.

“ An extraordinary circumstance, and one of not very unfrequent occurrence, is the act, namely, of decking out a number of truisms in a new garb, and of ushering them forth to the world as important discoveries.* Of a similar cast is the process of expanding some trivial circumstance into a copious theory, and of assigning to it a rank and importance, which facts by no means justify, though it serves to bolster up a claim to originality, that rarest of qualities.† As to the unhappy few, those who misrepresent the truths of nature—those who coin baseless facts whereon to erect a worthless notoriety—and those who deny, from sinister motives, the facts recorded in the experience of others, it is impossible to brand their conduct with sufficient infamy. But after all this, what do we know of the pathology of fever? I am afraid that our information extends but a short way into the curious and intricate phenomena presented by this wonderful disease. It is impossible to go beyond a certain length in our researches into the processes of our organization, but our knowledge of fever seems peculiarly limited.‡ A person feels himself affected with languor, stupor, headach, giddiness, pains in the back and loins, loss of appetite, thirst, and burning heat over the surface, and not less disinclination than incapability of exertion.§ How are

conservatio corporis in mixtione quidem corruptibili, sed sine omni corruptionis actuali eventu.—Stahl, *Theoria Medica vera*. Einem Organismus, dessen Thätigkeit wir wahrnehmen, Schreiben wir Leben zu.—Rudolphi, *Grundriss der Physiologie*, Erster Band, § 290.”

“ * It is no uncommon trick (says an original author) with some writers to invent and adopt, on the slightest pretext, complete new sets of technical terms—the more strange and uncouth, the better for their purpose; and thus to pass off long-known truths for prodigious discoveries, and gain the credit of universal originality by the boldness of their innovations in language: like some voyagers of discovery, who *take possession* of countries, whether before-visited or not, by formally giving them new names.—Whately’s *Rhetoric*, third ed. p. 270.”

“ † It is remarkable, that inflammation of the great veins, which has been supposed by some pathologists of late years, without any adequate foundation I conceive, to be a frequent cause of fever, was also looked upon by the ancients in this light; εὔτε ὁκόσοι τήνδε τὴν κατάστασιν εἶδον, (φλεγμονὴ ἀμφὶ τὴν φλέβα) καῦσον ἐκάλεον—Aretæus de Causis et Signis acutorum Morborum, lib. ii. cap. viii.—Τὴν τῆς, κοιλῆς φλεβὸς φλεγμασίην καὶ παχείης ἀρτηρίας, αἱ παρὰ τὴν ράχιν τέτανται, καῦσον ἰδέην ἐκάλεον οἱ πρόσθεν.—De Curatione acutorum Morborum, lib. ii. cap. vii.”

“ ‡ L’homme ne connaît l’essence de rien.—Cabanis, *Degré du Certitude de la Médecine*, Paris, 1819, p. 54.”

“ § Galen, not to mention others, seemed to consider the indoles of fever to consist, in some measure, in a very great augmentation of the natural heat: ‘Febrim esse, cum adeo immoderatè auctus calor est, ut et hominem offendant, et actionem lædat: quod si neutrum adhuc efficiat, quantumvis si homo nunc quam ante calidior, non tamen febricitare eum monstravimus.’—Methodi Medendi, lib. viii.”

these occurrences to be explained? From the suddenness of the onset, we should say that the nervous system is affected. There is probably a certain degree of congestion in the brain and spinal marrow; the function of innervation, both as regards the internal and external senses, and the power of muscular motion, has been seized with a rapid diminution of its energy. Sometimes, as in the case of plague, this diminution has gone the length of occasioning the instantaneous loss of life. Men stricken with the plague-poison, as we are told by Sydenham and others, have been known to stagger, fall prostrate, and expire. Is there any other way of accounting for death, except by the sudden suspension of the functions of the brain and its dependencies? To explain how the cause of fever, whatever it may be, thus operates on the nervous energies, would be to ascend to the consideration of a class of phenomena, which must for ever lie beyond the reach of human inquiry, and which, consequently, it would be vain to attempt to explore.* In a little time, the organs of respiration and circulation are affected, whether from the direct action of morbid nervous influence, is unknown. However that may be, the breathing becomes hurried and laborious, and the motions of the heart are increased in force and frequency. It is often difficult to determine in what cases, and how far, the current of the blood is limited in its velocity. When we consider the debility which is superinduced in fever, especially in the latter stages, we may presume that the circulation becomes slower, at least in the capillaries; as to local affections of the circulation, they remain to be spoken of. The precise period at which the secretory apparatus becomes affected, is unknown; it probably varies.† The sensible, and perhaps the insensible perspiration, is generally more or less suppressed from the beginning; all the excretions and secretions, however, are progressively vitiated; the saliva, the mucus of the eye, of the bronchial tubes, and of the intestinal canal; the urine, the bile, and most likely the pancreatic fluid, are all variously affected. The process of interstitial secretion and absorption, is probably much modified; the fat disappears, and the muscles lose their healthy aspect. Sometimes, in the advanced stages, an adventitious fluid is poured out in some of the so-called cavities—for instance, into the pleura, the ventricles of the brain, and the peritoneum. It is hardly necessary to go minutely into the varieties presented by the urine, bile, saliva, and so forth; they will be sufficiently noticed in the diagnosis. By the ancient physicians, they received a degree of attention, which would now be considered incommensurate with their importance. How far

* See Wilson on the Action of Morbid Sympathies, Edinburgh, 1818, p. 41."

† Während ihrem ganzen Verlauf eine verminderte Ernährung des ganzen Körpers, und im Anfang eine Beschränkung aller oder der meisten Secretionen statt findet, während gegen das Ende der Krankheit die Absonderungen vermehrt und meistens verändert eintreten, und damit die Krankheit aufhört.—Gmelin, Allgemeine Therapie, p. 188."

these alterations depend on deranged or lessened nervous influence, or on the depraved condition of the blood, or finally, on both, has not been exactly determined. The alterations of the blood itself, the queen of fluids and pabulum of life, are obvious from an early period. In many cases at first, particularly in fever of high excitement, or fever combined with inflammation, the blood, when drawn, is rich and tenacious, throwing up what has been called the buffy coat. As the disease proceeds, these characters are no longer present—the blood becomes thin and watery, nearly destitute of fibrine: indeed the deterioration is at times so great, that it is truly wonderful how life can subsist along with it.* It is reasonable to presume, in the course of fever, from the partial suspension of the all-important functions of the blood—its own reparation and arterialization in the first place, the diminution of the process of interstitial deposition, the retention of some ingredients, and the absorption of vitiated materials, which are not commonly, if ever, met with in sound blood, that this fluid is amazingly altered for the worse.† These diseased processes, operating in a circle, reproduce and aggravate the morbid changes already mentioned. No excretion, no secretion, so far as they continue to be performed, can be sound; and in the consummation of the universal degradation of solids and fluids, almost amounting to putridity, which sometimes ensues in fever, we cannot but feel the most lively astonishment, as I must often express myself, how a recovery can ever take place. The provisions which nature has in store for this purpose, it is at present beyond the scope of human

“* The old writers were many of them of opinion, that in the course of malignant and putrid fevers, so called, the blood itself acquired a foetid putrid character. It is impossible that the blood could ever become putrid during the life of the individual; in other respects, however, it may be greatly vitiated and loaded with impurities. For many interesting facts and observations on the subject, consult Bufalini, *Patologia Analitica*, Pesaro, 1828, tomo ii. pp. 166, 242, 286, 698.—Dr. Clanny (vid. *Lancet*) has stated that the fibrine of the blood in the course of fever becomes gradually diminished in quality, that the watery portion predominates more and more, and that the process of sanguification is partially or completely interrupted. Similar views have been entertained from an early period, and are now very general. I do not conceive, however, that these phenomena include the essence of fever, though, doubtless, they form a portion of the series of intricate and progressive changes which collectively bear that name.—Organic chemistry, though capable of throwing much collateral light on the healthy and morbid functions of the animal economy, is far, I conceive, from being able to reveal the nature and succession of processes so very different in complexion from those which are included under its own more peculiar province.”

“† Borelli says, that he once saw the blood in fever quite white. But his observations abound with so many marvellous relations, as occasionally to throw more than doubt on their authenticity; however, here is the passage: “Anno 1648, virum vidi febre maligna detentum, cujus sanguis statim à phlebotomia albedinem lactis retulit, quod rarissimum existimo, et a læsa facultate sanguifica chylum immutatum relinquente factum fuisse.”—Borelli, *Hist. et Observat. Medico-phys.* Parisiis, 1757. *Observat.* XXV. *Sanguis albus instar lactis.*”

faculties to fathom. Adequate and all-sufficient they frequently are; but we are no less confounded when we attempt to ascertain them, than when we try to determine the causes of the prostration which precedes their operation. One of the most remarkable things, perhaps, in the pathology of fever, is the excessive alteration which takes place in all the organs of relation, and which it is almost as difficult to appreciate, as to account for.* To the eye, light is sometimes intolerable—at other times, indifferent; sometimes colours are perverted from their ordinary seeming. Occasionally, objects seem to present themselves to the patient's attention, which have only an ideal existence, but which, to his consciousness, possess all the force of reality. The same observations may be applied to the other senses, those of hearing, taste, smell, and touch. The patient is perhaps annoyed with ideal sounds; ordinary ones are either felt with distressing intenseness, or pass unnoticed; the most delicious viands are repelled with disgust, the most fragrant perfumes are no longer relished, and the sense of touch, in its double capacity of perceiving resistance and extension, seems hardly to have any existence. The impressions arising from what are styled the internal senses, are very much modified indeed. Sensations generally of a disagreeable, if not distressing character, are returned from organs in a state of disease, from which any, or hardly any, unless pleasurable ones, emanate in health: they are almost insusceptible of analysis; but we are entitled to presume, that they constitute in the aggregate, that peculiar condition to which we may give the general appellation of a consciousness of ill health.† It is not to be expected when our objective consciousness, or our perceptions of the phenomenal world, to use German phrases, now, however, become general—it is not to be expected, I say, when this is so much altered from its normal condition, that our internal, or to use again the same sufficiently appropriate phraseology, our subjective consciousness, should remain unaltered. In fact it does not; the change is enormous. If the phenomena of mind are of difficult analysis during health—they are not less so in the course of disease. In many maladies our mental faculties remain comparatively unaffected; in others, and among the rest in fevers, they are sometimes completely overwhelmed. Associations both of feeling and mere intellection sometimes become jumbled to-

* “*Functiones sensiferas in febris æque adflictas esse, docent sentimenta morbosa, alior, æstus, et dolores.*—Töltényi, *De Princip. Pathol. Gen.* Vindobon. 1831, cap. LVIII. § 1669. La fièvre est une excitation cérébrale et nerveuse, idiopathique ou sympathique, qui se manifeste promptement partout l'influence de ces organes, et qui est aussi promptement qu'universellement répandue—Gorget, *Physiologie du Système Nerveux*, tom. i. p. 191.”

† Reil expresses himself nearly in a similar manner: “*Dieser anomale zustand wird der Seele durch das Gemeingefühl und zwar meistens als unangenehmes Gefühl dargestellt. Daher die Krankheitsgefühle, die wir Uebelbefinden nennen.*”—Reil, *Entwurf einer allgemeinen Pathologie*, Halle, 1815, Dritter Band, p. 233.”

gether and perverted in the strangest manner; this delusion at times amounting to absolute delirium.* Imperfect as are our notions of our corporeal—they have at least advanced beyond our conceptions on mental pathology, whether in continued, or occasional disease of the mind. Further observations on this topic would be here misplaced; the short mention, however, which has been taken of it, will surely not be considered superfluous in a matter of such importance, frequently too much neglected.”—p. 62.

Our readers will see from this passage, not selected, but taken at random from Dr. M'Cormac's book, what pains he has bestowed upon his subject, and what learning he has brought to bear upon everything connected with fever. We regret extremely that our limits prevent us from indulging in copious quotations from his work, which we beg to recommend to our readers in the strongest terms.

R. J. G.

A new Synopsis of Nosology, founded on the Principles of Pathological Anatomy, and on the natural Affinities of Diseases. By G. HUME WEATHERHEAD, M.D., Member of the Royal College of Physicians, Lecturer on the Principles and Practice of Physic at the Westminster School of Medicine, Corresponding Member of the Zoological Society of London, &c.

THIS is an excellent little book, and contains within a short compass a vast quantity of practical information, arranged in a clear and scientific manner. Although we are not of opinion that diseases can ever be classified so as to form a nosological system bearing so completely the stamp of nature, that it will be found to contain an exact location for any collection of symptoms which, arising in individual cases, are referred back by the observer to his nosological standard; and although we despair of ever so perfectly understanding the morbid operations of the living body, as to be able even to count the different

“ * Etwas stärkere Eindrücke treten auch im Wachen überaus lebhaft hervor, wenn der Organismus krankhaft aufgeregt ist; daher das Deliriren.—Meissner, System der Heilkunde, aus den allgemeinsten Naturgesetzen gefolgert.—Wien, 1832, p. 99.”

“ The delirium of fever, says Parry, is probably of different kinds in different cases.—Elements of Pathology and Therapeutics, p. 338.—*Difficilimam autem est, ob extremam hujus materiæ (delirium) obscuritatem, aut partes affectas assignare, aut diversos læsionum modos, quibus singulæ deliriorum species oriuntur.*—Gaubius, Institutiones Pathol. Med. § 735.”

affections which deserve different names, still we cannot help feeling that this department of medicine has of late been too much neglected, for except in diseases of the skin, little has been effected since the time of Cullen, and yet what advances have been made during this very period in the diagnosis of diseases. New names, it is true, have been invented, and new arrangements made by Dr. Good, but the former were so grating to the ear and untenable by the memory, that happily for the rising generation of students they have never been either learned or taught; while the latter, although excellent in many respects, had the difficulty to contend against of separating diseases that had been long associated together in nosological catalogues, and in consequence of this, it was generally rejected by the mass of practitioners, who are unwilling to make an effort to overcome the force of habit, an effort more than usually painful when applied to unlearning names artificially arranged, and which, indeed, having been but slowly acquired, offer a stout resistance when we endeavour to expel them from the memory.

Others have occupied themselves with what rather deserves to be termed nomenclature than nosology, for being too little versed in the nature of diseases to attempt their classification or arrangement, they have sought the aid of new words and new names, generally Greek polysyllables, which stand arrayed in their pages, a dense mass impenetrable as the Macedonian phalanx. These words, hard and angular when first transferred to the mouth of Dr. Ryan, or some equally Attic Demosthenes, become speedily water-worn and rounded by constant attrition, and are misapplied with the greatest fluency of utterance when a display of learning is required. To such persons we willingly resign the task of inventing novel words and terms. The nomenclature of diseases and their diagnosis are very different things, and the grand error of nosologists appears to us to consist in pushing the naming system too far. As yet no good treatise appears to have been written on the general question of how far this system should be carried. Indeed we doubt whether any given system of nosology would not be considerably improved by amputation of its two extreme ends, performed in such a manner, however, as to leave the body of the work untouched. This summary mode of proceeding would abolish all classes and orders, which, however useful in a botanical arrangement, where they assist in determining the name of any given specimen, are never thus used in investigating the nature of diseases. Here we always begin with the investigation of particulars, and all our questions tend to elucidate specific or generic characters. Genera and species we would retain, abolishing the classes and orders on the one

hand, and the specific varieties and subdivisions on the other. But let us not be misunderstood; we mean not to say that the information, the facts, the diagnostic characters which have been ascertained concerning these matters should not be imparted to the student; we would not withhold from him this knowledge; nay, we would wish to see this department elaborately worked; but this might be done without naming everything that is described, without naming every group of symptoms, or every distinct morbid change. In fact we think that the nature and use of language has been here misunderstood, and that much inconvenience and mischief have arisen from the vain ambition of conferring proper names on matters not possessing in themselves an individuality sufficiently permanent or definite to merit that distinction.

To illustrate these observations by an example, taken from the work before us: who, in studying the nature of a wound, ever finds out that it is a wound because it can only belong to the Class named *vitia* by Dr. Weatherhead? Dr. W. gives as a synonym for the word *vitia*, injuries, morbid formations, and malformations. To arrive at the nature of the case before him, the inquirer must next make out that it belongs to the Order, *dysalitica*, i. e. disunions affected by force; and here again he is required to exercise his discrimination in ascertaining that his wound belongs to Genus I., *plagæ*, i. e. injuries of a recent nature; but his labours do not end here, for he must next determine it to belong to *plagæ carneæ*, or injuries inflicted on soft parts, and finally, he fixes on the fourth species *vulnus*, where he finds six varieties, and many sequelæ, each dignified by a distinct name.

Now, in truth, no one can deny, that words have in the above instance been converted into names much too often; we do not mean to question the propriety of distinguishing a *lacerated* from a *punctured* wound theoretically and practically, but we see no necessity for affixing these adjectives converted into Latin to the substantive *vulnus*, and setting them down, thus dignified, to swell the recital of a nosological arrangement. This is making diseases vary with every adjective which can be predicated of them, and behold what is the result? why, the passage referred to! *Vulnus, simplex laceratum, puncturatum, penetrans, contusum, venenatum*. Does not this remind us of the method resorted to by school-boys in writing hexameter verses. They first take a good solid noun substantive, connected however remotely with their subject, and then they select from its train in the *Gradus ad Parnassum* as many of the ready made epithets as are sufficient to fill up the various gasp in their line, or lines. Let us see what this method of proceed-

ing will enable us to manufacture out of our excellent substantive *vulnus*. What says the *Gradus*? *Vulnus, cavum, apertum, patens, hians, hiulcum, sanguineum, cruentum, atrum, sævum, dirum, &c.* Now with all due deference to our author, we cannot see why he did not transfer the whole of this passage to his nosology; many of the adjectives are, to use a grammar phrase, quite as worthy as those he has selected. The word *ulcus* has been still more fortunate than *vulnus* in Dr. Weatherhead's Synopsis, (p. 74.) The following forms a character as complete of this *simple* but *irritable* personage, as any that ever came from the pen of Plutarch or Homer. *Ulcus, simplex, irritabilis, sinuosus, gangrænosus, specificus*, (here the metre suddenly changes with a grand effect,) *sarcophagousus! scrofulosus, tuberculosus! &c. &c. &c.* But the hero of the poem is evidently *excoriatio*. Whence came this mighty being? The muse declares his mystic origin to be

“ ab acribus.
 “ ab attritione.
 “ ab inflammatione.
 “ ab ambustione.
 “ a solido candente.
 “ a fluido fervente.
 “ ab aere calido,” &c. &c.

Surely this poetry eclipses the celebrated

Dies Iræ,
 Dies illa
 Solvet sæclum
 In favillâ, &c.

But to be serious; we beg it to be distinctly understood, that the objections we have made apply not to Dr. Weatherhead's work, more than to any other system of nosology written on the same principles of concise definitions. The use of tabular arrangements of medical subjects has always appeared to us very questionable. What abler synoptical chart was ever published than that exhibiting the stethoscopic phenomena of pectoral diseases, composed by Dr. Townsend; and yet, who ever now consults it? How many tables have appeared, affording views of the symptoms produced by various poisons, and the treatment applicable to each? and yet, who will have recourse to such a table, when knowledge on these subjects is either to be acquired or used?

Having said so much concerning the impediments, which we fear the cultivators of nosological science will find it very difficult to overcome, we shall allow Dr. Weatherhead the ad-

vantage of coming before our readers in his own words, and for that purpose we have selected the passage in his Introduction, which explains the principles on which he proceeded in forming his arrangement.

“It now becomes necessary to say a few words in explanation of the plan adopted in arranging the following Synopsis of Nosology.

“The author has found that he has been able, by following the natural affinities, to classify all the diseases resulting from the derangements proper to the body, spontaneous and incidental, under four principal heads. These form his classes—namely, the PHLOGOTICI, or pure inflammatory diseases; the HÆMAPHARMATICI, or those diseases which originate from a miasm or poison entering the healthy blood, and tainting it; thirdly, the NEUROTICI, which comprehend all those diseases arising from affections of the nervous system, unaccompanied by any apparent structural disorganization; while the last class, or the VITIA, comprises all accidental disfigurations, new morbid formations, extraneous lodgments, and congenital malformations.

“The first class, or the pure inflammations, consists of two orders—fevers purely inflammatory, produced by the ordinary causes of idiopathic inflammation; and the inflammations of the membranous tissues. The diseases of the first order are few, and of rare occurrence, as idiopathic affections, particularly the first of the species, or Synocha, to institute which it is manifest, that the subject of it must be in that perfect state of health in which there exists no morbid predisposition whatever; so that, when the morbid phenomena are fully instituted, the inflammatory action shall evince no particular local determination—a condition of the system so seldom met with, and so difficult to sustain, as the habits of society are constituted, that we cannot wonder at the rareness of its occurrence.

“The diseases of the second order, again, which are infinitely more common, comprehend exactly all those inflammatory affections wherein the general equilibrium of the inflammatory action just spoken of has no existence; in which, on the contrary, the morbid action is either confined to a particular part, without involving the vascular system generally, or, synocha being present, it is accompanied with some particular local determination, constituting, in fact, the membranous inflammations. This order is divided into two sub-orders—the one including the inflammations of the tegumentary tissue, both idiopathic and sympathetic—the other those of the internal membranes.

“It is this last sub-order that contains such a multitude of diseases, which, though all purely inflammatory, yet evince very marked differences in their pathological characters, owing to the great diversity in the structure of the tissues affected. The author, taking Bichât as his guide, has divided these into the mucous, the serous, the fibrous, and the cellular, to which he has ventured to add another, the albuminous; and, although Bichât has many more tis-

sues, the author has found the preceding sufficiently numerous for all useful pathological purposes.

"There is a class of diseases instituted within the body that are strictly humoral in their nature, produced by miasms or poisons being introduced into the healthy blood, either by inhalation or by inoculation purposely performed, or accidentally inflicted. These form the author's second class, or the *Hæmapharmatici*; and, differing as they do in their nature essentially from all other diseases, they can only be properly arranged by themselves. This class includes the fevers produced by miasms, whether of a vegetable or animal origin; likewise all those exanthems occasioned by infection, contagion, or inoculation; thus limiting the name to those efflorescences that ordinarily occur but once during life; and lastly, it associates with these, but in a distinct order, the morbid effects of animal poisons, not febrile or exanthematous, which, on entering the healthy blood, attack the vital principle.

"The diseases of the nervous system, like the *Phlogotici*, are numerous and varied, and form the third class of this synoptical arrangement—the *Neurotici*. I have divided them into four orders. In the first the reader will find those affections which are characterized by aberrations of the judgment; in the second, the diseases affecting the nerves of sensation; in the third are placed the diseases proceeding from affections of the nerves of motion; while the last, the most numerous list of the whole, comprises the diseases of organic function. In none of the nosological systems hitherto published do these form a distinct group, a circumstance which has necessarily compelled the author to assume a new term to designate the order to which they belong; and he has fixed upon the Greek word *ἐργατικὸς* to form its denomination. A similar reason has obliged him to find other new names for some of the tribes into which the order is subdivided. The diseases proceeding from the function of sanguification, for example, are ranged under the tribe *Hæmapoietici*; those ensuing from the state of the circulation he has classed under the *Hæmacyclici*; the functional diseases of the appetites form the *Orectici*; the tribe *Eccriciti* denotes the disorders of the secretions; while the functional diseases of the womb connected with pregnancy are arranged under the *Cyetic*i. The last three of these tribes do not require any particular explanation; but as the diseases belonging to the first two have never yet been grouped together as functional diseases, even by implication, a few words may be necessary to explain the author's views of the matter.

"The function of sanguification is capable of three different conditions: blood may be elaborated in excess, and thus induce not only a morbid predisposition, but a diseased state of the body itself, constituting, in fact, plethora; sanguification, again, may, through a debility of function, be defectively performed, thus constituting the disease called anæmia; and, lastly, the function may be depraved, and instead of elaborating healthy blood, a corrupt fluid may be the result of the morbid process, and thus give rise to scurvy. All these

three conditions of the blood, it may be observed, are not only diseases of themselves, but they embody morbid sequelæ that are frequently of a more fatal tendency than the diseased state from which they ensue. Hence it is, that we see a foundation laid by the first for secondary apoplexy, that is, rupture of some of the blood-vessels within the head from engorgement and congestion, or for some violent internal inflammation; while, in the other two, we find dropsical effusions into various cavities of the body as their very ordinary consequence.

“The diseases induced from the state of the circulation are not less interesting, and are of still more common occurrence. To the functional diseases of the circulation appertain all sanguineous congestions and fluxes, both active and passive, and their sequelæ are perhaps still more fatal than those ensuing from the diseases of sanguification. Apoplexies and palsies are their sequences; and if the sanguineous fluxes do not of themselves prove directly fatal, they are sure, by long-continuance or frequent recurrence, first to induce an artificial state of anæmia, and consecutively to be followed by the sequelæ of this state—dropsical effusions.

“The mention of sequelæ leads me naturally to remark, that diseases are not all primary in their nature, although, in arranging them, nosologists have never yet drawn the proper distinction between them; on the contrary, a great number of diseases are entirely morbid results of the primary disease, and many are again the sequences of these very morbid results themselves. Each of these the reader will find arranged in the natural order of their sequences in this new synopsis—a method that has not hitherto been adopted by any preceding nosologist. But it may be well to elucidate my meaning more distinctly, by exemplifying it. Let us take sub-acute hepatitis as the primary disease: a common morbid consequence of this is the interstitial deposition of coagulable lymph into its structure, which, on becoming organized, constitutes scirrhus of the liver. This is a sequela of the primary morbid action, but it is not its ultimate result, as we shall see by pursuing the subject a little further. Scirrhusity gives a preternatural solidity and induration to the liver: this naturally presents a constant and powerful obstruction to the free return of the venous blood from several of the abdominal viscera; a mechanical hæmostasis or congestion of necessity takes place in all the branches of the vena porta, which, in order to relieve themselves of the engorgement, force into the exhalants opening into the cavity of the abdomen an undue portion of serosity greater than the absorbents can remove, the morbid consequence of which is ascites. Here, then, we have two consecutive morbid sequelæ, each constituting a specific disease, the one being the subsequelæ of the other, besides the primary disease: indeed, it not unfrequently happens, that all these three morbid states shall simultaneously co-exist. The following, therefore, presents an illustrative diagram of the subsequent synoptical arrangements:—

Species 1. HEPATITIS.*Variety.* α. Sub-acuta.*Sequelæ.* α. Scirrhus.*Sub-sequelæ.* α. Ascites.

b. Hæmorrhœa intestinalis.

α. Recti.

The reader will further perceive b. *Hæmorrhœa intestinalis* and α. *Recti* superadded, by which it is intended to indicate, that sometimes, instead of dropsy being the sequela, as explained above, intestinal hæmorrhœa shall be the morbid consequence of the sanguineous engorgement; and the word 'Recti' is placed to shew when this proceeds from a particular part of the intestines, that is, from the hæmorrhoidal veins.

"This method of indicating the series of sequence and affinity is preserved throughout this synopsis; and the author has bestowed his utmost attention to deduce them in their proper order and place, so as to present to the reader not merely a correct nosological arrangement as to the nature of diseases in general, but a synoptical diagram, at the same time, of the relation they hold one with another, as consecutive series.

"The advantages of this arrangement to the younger members of the profession, and to students in medicine in particular, will be obvious, from its placing morbid phenomena before them based on the method of analysis. It is only thus that the natural alliances of diseases can be perceived, by connecting them together according to their pathological character, by which their affinities become obvious and intelligible, instead of classifying them, as has been done hitherto, in a manner wherein their natural relations were so much disregarded. For what can more forcibly exemplify this, than the practice of indiscriminately classing the sequelæ and sub sequelæ of diseases as genera or species, among those of a primary nature, to which they are imagined to bear some vague analogical affinity? The dropsies, for example, are placed, even by the sagacious Cullen, in his order *Intumescentiæ*, among which we find, most incongruously assembled together, polysarcia, the different chronic morbid enlargements of the viscera, emphysema, rickets, &c., and all from the single and indefinite character of *tumefaction* being common to them all. Sauvages goes even farther, and arranges retention of urine along with the dropsies.—The class 'Dolores,' again, among the older nosologists, afforded greater scope for still more inconsistent arrangements; and in later times we find Willan, from similar inaccuracy in adopting a fallacious criterion of distinction, congregating itch in the same order with small-pox. The principle, again, which Dr. Good adopted, relieved him from all observance of the affinities, either natural or pathological; and when these do coincide with his arrangement, it is altogether attributable, as a matter of accident, to the essential nature of the function forming the class or order. It is thus that the arrangement of his *Neurotica*

does not evince the same want of pathological connexion as we are compelled to observe in his classification of the diseases of the 'Digestive Function,' or among the multifarious and opposite diseases included in the affections of the 'Sexual Functions.'

"The plan of the following synopsis, differing as it does in so many respects from any other, has, as a matter of necessity, compelled the author to form and employ some new words, in a few instances; but, in venturing to do so, he has striven to conform them with the spirit of the accepted nomenclature of the day, and to introduce as few of them as he possibly could. For the most part, the new terms are formed to denote the nature of the new arrangement, and are, therefore, confined principally to the more abstract terms, such as the names of orders, tribes, and genera; and if, in one or two instances, he has presumed to change the name of a species, it has been solely for the sake of preserving a consistent uniformity, and only then where the term in use was either a solecism or an incorrect application of it with respect to its etymology, or to the pathological meaning it was employed to convey. No word is more frequently applied improperly by medical writers than one in very ordinary use—the word *chronic*. According to the meaning of its etymon (*χρόνος*), it ought imply, speaking of a disease, one that has lasted for some time; for it is manifestly a solecism in language to say of any disease that it was chronic at its commencement; and yet this is done every day. A person who is affected with one of the species of rheumatism, though it may be for the first time, is said to be attacked with *chronic* rheumatism. Now, though a disease may by persistence, subside into a chronic state, it always begins either in an acute or sub-acute form; and in the above instance, therefore, the disease is sub-acute rheumatism, not chronic. But this is not the only inaccuracy entering into the acceptance of the word *chronic*. When employed to denote the last stage of an acute disease, such as that state of debility of the veins remaining after acute conjunctivitis, the latter periods of catarrh, or of gonorrhœa when the muculent discharge results more from relaxation than inflammation, that I conceive to be its proper application and meaning; but the term is abused when it is employed to designate, what it often is, that state of re-excitement to which very many sub-acute inflammations are liable: here, though the disease be of long standing, its exacerbation cannot be considered of a chronic nature, but only a renewal of the sub-acute morbid action.

The name of every disease ought to express, as perfectly, and in as concise a manner as language will admit, both the nature of the disease and the exact seat of it. Thus the termination *itis* is now made by convention to denote inflammation; and when this is united with the name of the part inflamed, we have the disease accurately signified. It is from such a reason that the author has not hesitated to adopt several very useful words, especially those indicative of several ophthalmic diseases, as *blepharitis*, *dachryo-cystitis*, &c. from some of the best German writers; and in one or two in-

stances he has been induced to alter the nomenclature, where this was egregiously improper, as in the case of gonorrhœa and hæmorrhoids, adapting the new term to the general model; and, in another instance or two, the author has been obliged to form a new word altogether, from none being in existence, designating the disease, such as the sub-acute inflammation which affects the tunica vaginalis lining the scrotum and covering the testis, the common sequela of which is hydrocele. But as a general rule of observance, the writer has made it a point to interfere as little as possible with the nomenclature in use; for, though sensible that many names of diseases would not stand the strictest etymological scrutiny in reference to their propriety as apposite denominations, he is not the less persuaded of the impropriety of introducing any improvement in this respect in any other than the most gradual manner, and, as it were, *verbatim*.

“ With respect to the signs employed as distinctions, in the present synopsis, a few words will suffice to explain their import: the numerals, as will be seen, denote the species, the Greek letters the different varieties of the species, and any of the varieties having sub-varieties, such as being epidemic, or having more forms than one, these are indicated by italic letters. The morbid consequences, again, or *sequelæ*, primary and secondary, are distinguished after a similar manner. Thus, taking perichondritis, or inflammation of the perichondrium, as the species, we observe that there are two varieties of it—simple perichondritis, such as may affect the cartilages of the ribs, and synovial perichondritis, or inflammation of the inter-articular perichondrium. Now this last has three sub-varieties, the syphilitic, the scorbutic, and the scrofulous; while the varieties of the scrofulous, again, take their denomination from the joints severally, as they may chance to form the seat of the morbid action. The manner in which these several diseases are denoted, the reader will find thus:

“ *Sp.* PERICHONDRITIS.

“ *α.* Simplex.

“ *β.* Synovialis.

“ *a.* Syphilitica.

“ *b.* Scorbutica.

“ *c.* Scrofulosa.

“ *a.* Coxendicis.

“ *b.* Genu, &c.

“ By ‘General Sequelæ’ it is intended to signify the secondary diseases common to all the varieties collectively; but when a sequela immediately follows any particular variety, it simply denotes the secondary disease belonging especially to that form, and not to the others that follow. There are diseases, again, that are subsidiary to the *sequelæ* themselves, accruing, in fact, from them: these the reader will find indicated under the denomination of sub-*sequelæ*. The *sequelæ*, for example, of perichondritis, are two; first, absorp-

tion of the substance of the cartilage,* by which it becomes thinner, but not ulcerated; and, secondly, ulceration of the cartilage, a common consequence or sub-sequela of which is ankylosis. Vicarious enuresis, in consequence of suppression of urine in nephritis, furnishes another example of a subsidiary sequela, where the urine is at times excreted from the skin, or it may be effused into the ventricles of the brain.

“For the sake of distinctness, the inflammations of the several tissues have been treated of separately; but it must always be held in mind, that an inflammation commencing in one tissue is extremely apt to involve another, though of a different texture, if contiguous, in the same diseased action. For example, inflammation of the pleura covering the lungs is exceedingly liable to extend to their parenchymatous structure, thus forming pleuro-pneumonitis; but in such a case the inflammations of the specific tissues have each their distinctive symptoms; and, therefore, even when an inflammation extends its sphere of action into another tissue, we are enabled to detect it by the supervention of a new set of symptoms. The only exception, perhaps, to this law in pathology, is when several distinct tissues are wounded by one and the same cause; then the different sets of symptoms may be nearly simultaneous in their appearance; but this is a circumstance that does not affect the general law, neither can it well mislead us. These complications, therefore, are not specially noticed in the following nosological arrangement.

“To conclude, the writer may be permitted to observe, that it cannot be expected he should enter into a full development of so extensive a subject as the present, or elucidate views so important as those embraced by the outline he has barely sketched, in the narrow limits of an Introduction. Suffice it for the present to say, that such constitute the principles on which his lectures are based. The subject has occupied his attention and thoughts for years; and he fain would hope, that the prosecution of it will tend to facilitate both the study and the satisfactory illustration of disease, by affording, to the student of medicine in particular, the means of acquiring a just idea of morbid affinities; and by thus associating diseases in a connected se-

“* Some have been much inclined to doubt whether cartilage be an organized part of the body, simply from the circumstance that they have not been able to inject it, or to observe vessels in it when evidently diseased; but both circumstances have little weight, in my judgment, as being conclusive against their vitality, when we give due consideration to the fact of their being not unfrequently partially absorbed without being ulcerated. To measure the limits of vitality by size and vermilion, is graduating the powers of life by a biometer neither accurate nor applicable. Neither can we inject the cornea in its healthy state, or crystalline lens, and yet disease can do both: so are they also capable of being absorbed, and of having matter (coagulate lymph) deposited within their structure. It is necessary to ask, or to answer, how, and by what means these effects are accomplished? Anatomy and pathology go hand in hand in reciprocally elucidating each other, and both must at times be received in evidence circumstantially.”

ries of relations and sequences, a correct knowledge of them will be attained by simplifying the diversity of morbid actions, which otherwise only confuse the understanding by being unconnectedly subdivided, or discordantly grouped."—pp. xvii. xxxix.

R. J. G.

Beitrage zur Lehre von der Eyhüllen der Menschlichen Fötus.

Von Dr. TH. L. W. BISCHOFF. Bonn, 1834.

Contributions to Human Ovology. By Doctor TH. L. W. BISCHOFF, &c.

THERE is no subject within the wide range of human knowledge possessing so profound an interest as researches into the mode of, and provisions for, intra-uterine existence. Panoplied in the glories of his mature intellectual powers, man may be to us an object of amazement and possibly of admiration; but when we endeavour carefully, step after step, to trace back the stream of life to its source, it is with breathless anxiety, nay a feeling of awe, that we approach the solution of the problem. If we examine the structure of the human frame and carefully investigate the strict interdependence of the various organisms, the circle of their mutual relations—without beginning and without end—each function communicating and receiving impressions necessary to the continuous performance of the whole series, the aliment for each derived certainly from without, but the motive-power self-centered, we are irresistibly impressed with the individuality of man, his isolation, his physical independence of his fellows. So complete is our conviction of this, that we can scarcely conceive that it has ever been otherwise with him. Our imaginations would fail in reaching the point where this characteristic is lost, and man is merely *a thing*—an organic particle in organic union—a molecule, which, with other molecules, makes up an organ, enjoying the same species of life, and destitute of all which would shadow out its future being. And yet, anatomy, so far as its province extends, would appear to put this beyond a doubt. Examine a Graafian vesicle before its peculiar stimulus has been applied, and what do we discover? A certain form and structure with certain relations to surrounding parts of the ovary, and which, if they do not apparently preclude, certainly do not induce the conception of its future independent existence. However, at a certain period of its development a stimulus is applied which impresses upon it the character of a separate, though not at first of an independent being; and from this moment, that series of phenomena commence their unfolding, which terminates in the perfect establish-

ment of its individuality, and which, whether examined earlier or later, bespeak as well their author as the grand destiny of their subject.

It is perhaps more than doubtful whether we may ever be permitted to discover the spring, the *primum mobile*, of this wonderful evolution. If we are to do so, certainly the first step must be by accurately ascertaining the conditions under which the changes take place, and the exact nature of the changes themselves. Much has been done of late years for this purpose, and much remains to be done; many errors have been cleared away, and considerable information acquired; but the field is still very wide and scarcely half explored. We are deeply indebted to the researches of Velpeau, Brischet, Lee, Granville, Seiler, Burdach, &c. &c.; but there is abundant room for more, and we are glad to introduce to our readers another indefatigable labourer, M. Bischoff, whose work is at least a proof of his industry, if it does not increase very much the amount of our knowledge on the subject. After some general observations, by way of introduction, his work is divided into five chapters: 1. On the Decidua; 2. The Chorion; 3. The middle Membrane; 4. The Amnion; and 5. On the early Nutrition of the Fœtus. We shall make a few remarks on the more interesting parts of his work.

As to the *membrana decidua*, very properly regarded as belonging to the uterus, rather than to the ovum, opinions on the continent are extremely divided. Some agree with W. Hunter in considering it a secretion from the lining membrane of the uterus, analogous to the membranous exudation, which takes place in certain inflammations, and requiring an excited activity for its production. Velpeau and Seiler, however, have strongly opposed this comparison; the former considering this membrane as a mere inorganic secretion or excretion due wholly to the mechanical irritation of the uterus by the ovum: the latter, (Seiler,) following the opinion of MM. Mayer and Weber, (who adopted the view of Sabatier,) that the decidua was not a new product at all, but merely the lining membrane of the uterus, rather more highly organized than usual in consequence of conception, and subject to repeated decadences, according to the number of pregnancies, and to as frequent reformations. M. Bischoff does not object to the comparison made by Hunter, since he says:

“It is certain that those pathological and physiological processes are very similar and nearly related; for both arise from the increased determination of blood to the uterus, (in pregnancy by conception and in inflammation by the inflammatory stimulus,) the fibrine of

which, overpassing the limits of the organ, is organized into a new product."

But though alike in their origin, he conceives that a considerable difference ultimately exists between them. He agrees with Lobstein in utterly rejecting Seiler's view of its nature as extremely improbable, as far less agreeable to what is known of such productions, and as unsupported by any observation. He differs equally with the last named author and others on the continent, and with Hunter and Lee in our own country, with regard to the mode in which the decidua reflexa is formed. They conceive that the ovum escapes from the fallopian tube either into the cavity of the decidua vera, when it becomes covered with a new membrane, a secretion from the vessels of the chorion and from the decidua vera, (Seiler, Mayer, Roux, Alexandrini,) or a deposit from albuminous fluid, contained in the sac of the decidua vera, (Lee, &c.); or else that the ovum, in escaping from the tube, passes between the split laminae of the decidua vera, (W. Hunter,) and so is covered by a membrane on its free surface as well as on that part in contact with the uterine parietes.

This supplementary membrane is the decidua reflexa, membrana ovulina, vel ovi uterina. M. Bischoff adopts the view maintained so ably by Wagner, Burdach, Velpeau, Granville, &c. that the d. reflexa is formed by that portion of the decidua vera, protruded by the ovum in its exit from the fallopian tube, and rejects the opposite view on very just grounds, as attributing functions to the flocculi of the chorion which we know them not to possess, and as being unsupported by the investigation of extra-uterine (abdominal) foetations. With respect to the two cases (of Sir E. Home and Weber) brought forward to prove that the ovum is unattached to any part of the uterus at very early periods, he looks upon them as invalid: the first as being no conception at all, (Velpeau,) and the second as being very imperfectly observed.

Our author next touches upon the persistence of the decidua, in order thence to throw some light upon the question of its vascularity, asserted by some (Lobstein, Hunter, Brischet, Lee, Radford, &c.) and denied by others, (Velpeau, &c.) Opinions as to its persistence vary very much, and, generally speaking, are loose and inaccurate; some viewing it as a special provision for the ovum during the early months of pregnancy, and ceasing its functions in great part as the placenta becomes developed, and at last, being discharged in shreds and patches with the lochia. Others go not so far, but conceive the decidua to be diminished to a thin covering of the chorion; and, lastly, a few authors describe the outer coat of the

after-birth as the decidua vera and reflexa united, but reduced to an almost unorganized layer. The first opinion is by far the most common. Now, M. Bischoff declares, (and engages to prove at any time,) that in each after-birth there is a sufficiently thick and consistent membrane to be found external to the chorion, very evident after a little maceration, and especially near the placenta. This he contends is the decidua. It varies in thickness in different cases, and in different parts of the same subject, being much more consistent near the circumference of the placenta, where its attachment to the smooth and transparent chorion is the most intimate. If we take this membrane we can separate it naturally into two layers, particularly the thick portions of it. The external is the decidua vera; and the internal, thin and smooth, is the decidua reflexa. Numerous vessels are discoverable in the latter structure which have no connexion with *the chorion*. Our readers will instantly observe, that this description of the decidua is nearly identical with that given of the chorion by other authors, and this is acknowledged by M. Bischoff, who conceives that all descriptions hitherto are defective on this point. We cannot but feel that when M. Bischoff's opinion is placed in the scale against the views of so many able men who have taken the other side of the question, it will fairly and justly be found wanting. Yet, perhaps, the expression of an opinion so unusual may indirectly benefit us by leading to more accurate investigations: and this much may be said in favour of our author, that his examinations of these membranes was undertaken at the termination of pregnancy, whereas previous writers have almost all confined themselves to dissections of the early ovum. Passing over the chapter on the chorion, which, however, contains much interesting matter, we come to the author's description of "the middle tunic which has not hitherto been described;" and though we are far from adopting the opinions laid down—yea, though we think the author somewhat over anxious to make a discovery, still if it stimulate us to examine for ourselves, it will not be without use. We are very carefully impressed at the beginning of the chapter that this "middle membrane," (*die mittlere haut*,) is by no means the "membrana media" of *Haller, Hoboken*, &c., but one of quite another kind, and the undoubted property of the author; nor in spite of a suspicious family likeness, has it any relation to the allantois of *Velpeau* and others. The ground being thus cleared, and the right of possession settled, we are told—

"That the chorion and amnion are not connected together by a cellular web, (as is commonly stated,) but throughout their entire

periphery by a peculiarly constructed, thin, and gelatinous membrane. If the chorion and amnion be separated, it may adhere to either one or the other, or shreds of it may be attached to both. Or take a portion of the amnion, (to which this membrane is adherent,) and moving it about between the finger and thumb, an experienced observer will instantly discover that there is a double membrane. But perhaps the best method is to stretch a portion of the amnion or chorion (to whichever this third membrane may be attached) pretty tightly over a piece of glass, so that the 'middle membrane' shall be in contact with the glass, then with the forceps carefully remove the chorion or amnion, and this said membrane will remain, and may be submitted directly to microscopical observation.

"Although it may be obtained of a dry membranous appearance, if taken from a situation where it was not in immediate contact with fluid, yet it rapidly absorbs water when immersed in it, and then appears as a thick gelatinous structure, which may have been mistaken for very thick mucus. It is, doubtless, upon this difference of character that the greater or less facility of separating the chorion and amnion depends. Under the microscope it was observed to be transparent—somewhat filamentous; the filaments collected in a greater or less number; sometimes straight, occasionally branching or regularly divaricating; the diameter about equalling that of a 'globule of frog's blood,' or rather more."

What these flocculi really were; whether blood vessels, lymphatics, canals, or mere depressions of some vascular net-work, puzzled our author for a long time; but after many observations, he thinks them sanguiferous tubes, but which may have become more or less obliterated as pregnancy advanced. But that it would be quite too simple an explanation, after all the trouble the author has taken to exhibit scientifically this middle membrane, we would suggest its being nothing more than the gelatinous fluid so commonly found between the chorion and amnion, considerably inspissated, and, therefore, admirably adapted for receiving various impressions from the membranes with which it is in contact, and giving rise to the appearance of "canals, lymphatics, or depressions, from some vascular net-work;" and, moreover, we believe that there is a preparation in Dr. Montgomery's museum, (prepared with his usual felicity,) exhibiting precisely this state of the parts in question.

We are astonished at our author's adopting the old view of the amnion and epidermis being one and the same membrane; the latter being merely that part of the former which incloses the embryo by folding round it. As to the continuity at the abdominal insertion of the cord, which evidently gave rise to the opinion, very little observation, indeed, of the embryo at an earlier period would have settled this question, since the abdo-

minal parietes are not formed until about the sixth week, and the cord is inserted at once into the small intestines, (Meckel,) with the serous coat of which the amnion must be continuous, instead of the epidermis. It is only after the occlusion of the abdomen that we observe the junction of these two very dissimilar structures.

Our limits prohibit our entering on the subject of the nutrition of the embryo; about which we cannot quite agree with M. Bischoff. However, in order to give as accurate a view as possible of our author's opinions and discoveries, (?) we shall conclude our notice by a literal translation of the "Résumé" appended to his pamphlet.

" 1. In every perfect human ovum, four membranes are distinguishable at any period of intra-uterine existence: viz. 1. the *decidua*, derived from the uterus; 2. the *chorion*; 3. the *middle membrane*; 4. the *amnion*. The three latter belonging to or (with the embryo) forming the ovum.

" 2. The decidua exists from the earliest period of pregnancy to its conclusion, when it is expelled with and after the secundines.

" 3. In an expelled ovum, we observe either the decidua reflexa alone covering the chorion, or portions of the decidua vera here and there, and forming together in the external covering of the after-birth.

" 4. The decidua vera and reflexa evidently possess blood vessels.

" 5. The decidua reflexa is probably formed from the 'infolding' of decidua vera, though some appearances seem to indicate the contrary.

" 6. The chorion is the outer part—the rind of the ovum—enclosing the germ before fecundation.

" 7. The chorion consists originally of two laminæ, soon united, and which can only be separated in small portions; between these laminæ run vessels derived from the embryo.

" 8. The chorion itself possesses no proper demonstrable blood-vessels.

" 9. The flocculi of the chorion are portions of the external lamina, which contain vessels derived from the embryo.

" 10. The placenta is only the more perfect development of these flocculi, and of the therein-contained vessels, in that part of the surface of the ovum which is in contact with the uterus. On the rest of the surface they remain in a much lower state of development, and are more or less obliterated.

" 11. From the earliest time that the embryo and the circulation between it and the vesicula alba begins to be formed, there exists between the chorion and amnion a series of vessels derived from those of the embryo and bound together by cellular network; their increased development in one part giving rise to the umbilical vessels. At a

very early period this vascular web is plainly to be seen, but when the chorion and amnion are in contact, it is converted into a delicate tunic—the middle membrane.

“12. In the space between the chorion and amnion, the vesicula umbilicalis is contained at an early age.

“13. In its double connexion with the embryo by the vasa omphalo-mesenterica and the ductus vitalis intestinalis, as well as in other analogous relations, the vesicula umbilicalis corresponds to the vitelline sac of the eggs of oviparous animals.

“14. This is not, however, the second vesicle observed either in the fecundated or non-fecundated ovulum: but, as in the eggs of birds, it is only a product of the development of the discus proligerous.

“15. The discus proligerous, on the contrary, is the second vesicle observed in the fecundated or non-fecundated ovulum, and in man and the mammalia, resembles a bladder in appearance.

“16. There is no allantois, properly so called, in man, since it appears merely a pouch-like continuation of the urinary bladder, never surpassing the sheath of the umbilical cord, and soon shrinking into a solid thread or thin tube—the urachus.

“17. The amnion is a prolongation of the serous lamina of the germ-tunic, and is continuous with the cuticle of the embryo, which is placed neither upon nor within it, but merely inclosed in its folds.

“18. The amnion exhibits no proper vessels.

“19. On its inner surface, the amnion is covered by a granular layer, the origin and object of which is not yet made out.

“20. The first development of the embryo takes place in man and the mammalia, as in birds, by the unfolding of the germ-tunic, and at the expense of the nutritious part of the ovum, until the appearance of the vascular system commencing with the vesicula alba.

“21. The further nourishment of the embryo until the formation of the placenta and umbilical vessels, is not performed, as has hitherto been thought by imbibition and absorption, &c. through the chorion, but always through the embryonic vessels, which run between the chorion and amnion to the flocculi of the chorion, and there take up nourishment. These are, at an early period, the rudiments of subsequent umbilical vessels.

“22. The assumption that the ovum and embryo are nourished until the appearance of the umbilical vessels, (i. e. till the second half of the second month,) by resorption and imbibition, &c. through the chorion and its flocculi, which is regarded as a simple, organized, unvascular structure, is quite inadmissible from the fundamental laws and phenomena of organic and especially of animal life. The comparison of the nutrition of the ovum with that of plants is, therefore, only tolerable on the presupposition that the roots of plants possess a similar organic texture, and like vessels, and even then it is very questionable.”

F. C.

SCIENTIFIC INTELLIGENCE.

SURGERY AND PATHOLOGY.

Letter from the Royal Academy of Medicine in Paris, to Mr. Carmichael of Dublin.—We have much pleasure in communicating to our professional brethren the following letter lately received by our fellow-citizen, Mr. Carmichael. He is the first Irishman, we believe, on whom so distinguished an honour has been conferred, and certainly, the members of the French Academy of Medicine have proved by this selection, that they are guided in the election of corresponding members by the only feeling which should have weight on such occasions, the consciousness that the object of their choice is worthy of so enviable a distinction. On such occasions it is no easy matter for public bodies to avoid all censure in thus stamping the character of an individual with the testimony of their approbation; they necessarily incur the risk of exciting the envy of many whose merits have long since earned the inestimable reward of self-approbation, and who, looking down from the eminence on which they have placed themselves, view with contempt the diminutive objects that surround them, and challenge respect and admiration as the scientific giants of the land. This race existed no where in greater abundance than in Dublin; the stature of our literary champions, as estimated by themselves, was enormous, and well might the mere announcement of their reputed dimensions frighten all ordinary and comparatively pigmy competitors from the lists. At the very commencement of his career, Mr. Carmichael was assailed by these formidable rivals; but he persevered in the race he had to run, regardless of the swarm of idle mosquitoes which buzzed about his head, and which are ever ready to annoy the progress of successful industry.

We are sufficiently old to recollect, not the golden age, not the age of silver, but that of mercury, and we have perambulated month after month the wards of the Lock Hospital, in Dublin, before Mr. Carmichael wrote his remarkable work on Pseudosyphilis, and the Abuse of Mercury. We well remember the outcry that work excited, and the opposition Mr. Carmichael was destined in consequence to experience; but who will now venture to assert that Mr. Carmichael's book was not at the time eminently useful?

We are not inclined to agree in all the opinions which Mr. Carmichael maintains on the subject of the venereal disease, but we are

only reporting the universal judgment of authors and teachers in France, Germany, and America, when we assert that his work formed an epoch in the history of the treatment of syphilis, and has produced directly and remotely good effects, which will entitle him to be ranked among the benefactors of mankind. Had he written nothing else, had he done nothing else, the Royal Academy of Medicine, in Paris, would have been fully justified in the choice its members have made; but we must abstain from further eulogy, and hasten to gratify our readers and ourselves by the letter of the Academy:

“ ACADEMIE ROYALE DE MEDECINE.

“ Paris, le 10. Mars, 1835.

“ MONSIEUR,

“ Nous avons l'honneur de vous informer que, dans sa séance du 24 février dernier, l'académie royale de Médecine de France vous à choisi pour être un de ses correspondans. Ce choix est un hommage qu'elle rend à vos lumières, à vos talents, à votre zèle pour le progrès des sciences médicales. Elle ose se flatter qu'elle recevra de vous les communications les plus fréquentes, comme elle a la certitude que ces communications contribueront à l'éclairer sur les diverses branches de ces sciences si nobles et si nécessaires. C'est par le concours de vos efforts et des siens qu'elle pourra remplir la glorieuse mission qui lui est confiée, de servir les hommes et de laisser à la postérité quelques verités utiles.

“ Nous sommes avec la plus haute consideration,

“ Monsieur,

“ Vos très humbles et obéissans Serviteurs,

“ *Le Président,*

“ S. LISFRANC.

(Seal.) “ *Le Secrétaire perpétuel,*

“ E. PARISSET.

“ A MONSIEUR LE DOCTEUR CARMICHAEL,

“ *à Dublin.*”

Memoir on the Obliteration of the Bronchi, by M. Reynaud, from the Memoirs of the Royal Academy of Medicine.—M. Reynaud has observed three forms of obliteration of the bronchial tubes. In the first the cause was external to the tubes and the obliteration

effected by tumours on their circumference or in their neighbourhood. In the two others the cavity of the tube was the seat of the morbid affection; the obliteration being dependent on the formation of an accidental matter which converted them into a solid cord, and at other times on a complete *coarctation* of the parietes in points more or less remote from the origin of the bronchi. M. Reynaud next impresses the necessity of a clear notion of the disposition of the bronchi in the substance of the lung; on their manner of dividing and terminating, so as to form its parenchyma proper; and he considers that, from the facilities the lung affords of resolving all questions regarding its minute anatomical structure, the opinions of anatomists respecting it should not diverge so much as they have hitherto done.

Persons are generally agreed as to the disposition of the bronchi and their branches, so far as dissection can reach in ordinary cases. Every where they are found to form a system of tubes continuous with each other, sometimes dividing into two branches, at other times irregular in their distribution; oftentimes very minute branches spring from far larger ones, and soon lose themselves in portions of the neighbouring parenchyma. Every where these conduits are found independent of each other, never anastomosing in any point as blood vessels do, and consequently being unable to supply themselves as far as regards the passage of air to those parts where they terminate.

Thus the difficulty exists only at the limits of the bronchi, viz. where they terminate in the pulmonary lobules whose combination forms the total mass of the organ.

Some anatomists pretend that when arrived at this point, the smaller bronchi cease to exist as ramifying tubes, and are lost in a peculiar spongy tissue, whose cells communicate with each other in all directions. This was the opinion of Helvetius and Haller, and is at this day the opinion of a very great number of anatomists.

A good while since Malpighi proved that such was not the mode of distribution of the bronchi; that all of them, on the contrary, continue, still ramifying, to divide into branches more and more numerous, and to terminate in an infinity of *culs de sac*, forming no communication but at the point of divergence. The truths of Malpighi have been confirmed by Reisseissen, who has given such a number of demonstrations as should remove all doubts. This doctrine is the same as that inculcated by M. Andral, in his Treatise of Pathological Anatomy.

Few, however, have repeated the experiments of Reisseissen; some have believed them on his word, others found it more convenient to reject facts, of which an attentive examination would have demonstrated the truth.

M. Reynaud has repeated the greatest part of the experiments of Reisseissen. His own words are,

1. I have several times examined the lungs of foetus that had not breathed; and into the bronchi of which I have caused mercury to penetrate. Then if I found minute lobules at the edge

of the inferior lobe, I saw very distinctly a bronchus of a small size penetrate it, divide successively into several branches, and each of these latter subdivide in the same manner, and so on a great number of times. These divisions more and more short, and of a calibre more and more circumscribed, ended by becoming as it were knobbed, and causing an appearance of *culs de sac* or pittings, and at length terminated by a closed extremity. Thus, the mercury that could not be made to proceed farther onward, presented itself under the form of a perfectly regular tree, whose terminal ramifications did not communicate laterally with each other, and this was proved by the portions of mercury not combining when the parts were pushed towards each other. If the finger caused the mercury to advance, the small bronchial tree was formed before the eyes. And what proved that the passages through which the mercury proceeded really pre-existed, was that if the compression was removed the mercury retired, but returned immediately to the same point, and in the same form. When the mercury came to its limit, it no longer made any advance even under a strong pressure, and the form and position of the globules remained invariable, and did not combine with those in their neighbourhood.

2. I have been able in numerous other cases to recognize the same disposition, without any injection or preparation whatever, and with the naked eye in the lungs of animals and of adult males, with whom the pulmonary vesicles or ultimate terminations of the bronchi have a greater capacity than in the foetus: a preparation exemplifying this I have preserved. What prevents the easy evidence of this in a fresh adult lung is, that the bronchi all terminate more or less perpendicularly to the pleura, which causes us to see only the group of their terminating *culs de sac*, and not the tubes and the trunks from which they originate, yet in some instances I have been able to discern through the pleura the partial course of some of these tubes and their terminations. This occurrence was, no doubt, owing to some of the tubes, of a greater length than usual, having arrived at the pleura, and then taking a course of three or four lines parallel to its surface, describing the regular arborescent appearance by the contained air, as well as if it had been done by mercurial injection.

3. As a proof of the truth of Malpighi's and Reisseissen's views of the terminations of the bronchial tubes, I shall adjoin a dissection of my own.

By means of very sharp pointed scissors, and with the precaution of often inflating the bronchus that I was cutting, for the purpose of seeing it distinctly, I arrived at the distance of four or five lines from the periphery of the lung. The inflation allowed me to see that the bronchus was continued farther without ceasing to be a regular canal. I then found that by gentle efforts a hog's bristle penetrated without difficulty to the pleura. By making use of the bristle as a director, I was enabled to dissect the bronchus a little farther, and to see its internal surface every where continuous, smooth, and hav-

ing openings leading into bronchial ramifications of still smaller calibre. I was then at two lines distance from the pleura. To complete the dissection, it was necessary to push the bristle through the pleura, and bending down the protruded end, so as to join its other extremity, and so form a handle, I was able by raising it lightly to enter the point of the scissors into the small bronchial cavity, and so complete its dissection, the tube appearing to have the same smooth lining, and continuous with the remainder of the bronchus. However, at two lines from its termination, it presented numerous perforations leading to other more minute tubes.

Laennec, who has demonstrated so much of the pathology of the lung, acknowledges that he could not pronounce an opinion on the intimate structure of this organ; pathological facts not having furnished him with elements sufficient to resolve the question. For my part, if I were allowed to go to that source, I should find in the dilatation of the bronchi, (which I have often observed to extend to their ultimate termination, and with alteration in their capacity only,) arguments suited to the demonstration of the preceding observation.

One of the principal forms of obliteration that I have mentioned in the beginning of this memoir, is that of complete occlusion of air from adhesion of the parietes without foreign matter being contained in the cavity, and without external compression. As this is the form of obliteration, that I have most frequently made observations on, and the one whose existence *a priori* would be least likely to be foreseen by reason of the nature of the mucous membrane lining the air passages; I shall begin by relating the facts that refer to it:

ART. 1. *First sort of Obliteration.*—The most simple form of obliteration of the bronchi, is that of the vesicle itself, or rather the species of *cul de sac* that terminates the tube. First fact: In the lung of a patient who had died from an attack of hæmoptosis, several lobules were observed at the surface of the lungs, whose disposition was such, that in place of their ultimate bronchial ramifications terminating more or less perpendicular to the pleura, as most frequently occurs, they arrived at it so obliquely, that for the length of four or five lines, they were quite subjacent to this membrane, whose transparence allowed their course to be easily traced. In one of those lobules, one of the little trunks, so far permeable, became suddenly obliterated; air could not be propelled through it by pressing with the handle of the scalpel, and the tube was most plainly to be seen degenerating into a very small white fibrous solid cord, which, having ramified twice or thrice, terminated in the lobule at the pleura.

ART. 2.—A second species of obliteration of the bronchi differing from the preceding by its seat, was one that I have met with in branches of the fifth or sixth class, consequently very near their termination, and at some lines from the pleura, yet within the parenchyma of the lung. To discover it, it was necessary to cut into the organ, following cautiously the bronchial tube, when I arrived at a

cul de sac, easily recognized as an anormal termination: for the incised bronchus, at the point where the instrument was stopped, was still of sufficient calibre to furnish secondary divisions. And, besides, with close observation, the small bronchus was found to proceed beyond the obliteration, continuous with a slender firm resisting cord, which furnished fine ramifications, and was easily isolated by gently scratching away the pulmonary tissue. In this way it was exposed and followed to the pleura, where it became capillary; the length of the cord of continuity giving the distance from the periphery of the organ at which the obliteration took place.

ART. 3.—A third form that I have met very often, was one in which the obliteration was seated, as in the former case, at some distance from the pleura. But while the former could be detected only by dissecting the last bronchi with very fine scissors, the latter was easily announced by a common blunt probe, which, being introduced into the principal bronchus, was suddenly arrested when attempted to be directed through neighbouring ramifications, situated at the same distance. If the bronchus were dissected as far as the point where the obstacle existed, the obliteration was found to be situated in a tube of a larger calibre, which, though near enough to the surface of the lung, did not exhibit characters proper to dilatation of the bronchi. The obliterated bronchus, in like manner, was prolonged by means of a similar fibrous cord, but larger than in the preceding case, though not occupying a longer course to arrive at the pleura.

To this disposition was joined another of the pulmonary surface itself, viz. that in the corresponding point this surface presented a more or less sunken appearance; hence, it was natural to conclude, that it was owing to the retreat of the surface of the lung in this point, that the obliteration was so close to the surface, and that the fibrous cord of continuity was so short.

The first consequence to be deduced from these facts is, that it is not only by the length of the cord of prolongation, that we can appreciate the point of the bronchus, where the obliteration has taken place, but we should take into account the calibre of the obliterated bronchus, the thickness of the cord of prolongation, and the state of the surface of the lung in the part corresponding.

We can conceive how the obliteration of a bronchus, involving that of all the branches that spring from it, as far as the pleura, should cause a sinking of the pulmonary tissue, and a depression more or less considerable of its surface in the point corresponding.

The disposition pointed out in this article and the preceding one I have observed not only near the pulmonary surface, but also in more central parts in the course of the small ramifications destined for the internal lobules; for the bronchi terminate at all distances, and often large ramifications give birth to very small ones, which terminate near their origin. In those cases I have always been able to trace the fibrous cord beyond the obliteration, and in its primitive course.

ART. 4.—The fourth and last species of obliteration that we have

observed was that occurring in the more voluminous bronchial trunks, or those destined to furnish others more or less considerable to the lung. Of these I have above a score of preparations.* These cases do not differ essentially from those already mentioned; but by reason of the great number of bronchi, whose obliteration was the consequence of this lesion, and of the peculiar forms of structure to which it gave birth, they deserve to be considered apart.

We have observed this obliteration at all distances along the tubes, from the first branches that come off from the main trunk that enters the lung, to those that, in all ordinary researches, are most easily cut into by probe-pointed scissors.

On cutting into the bronchi, which was always done with the greatest facility, they were found always to terminate more or less abruptly in *culs de sac*, at variable distances from their normal point of termination. Still this interruption existed only in their interior, and no cavity was traceable beyond, for externally they were continued by a solid fibrous conical cord, which insensibly diminishing in volume, could always be traced, or else some of its divisions, near to the surface of the lung, or even under the pleura itself, whatever the distance might be from the point where the obliteration began to the periphery of the lung.

The disposition of these fibrous cords was in other respects very variable; sometimes they were seen to divide and subdivide in a very regular manner, as the bronchi themselves do, and to terminate in the neighbourhood of the pleura, by an innumerable quantity of slender filaments; sometimes a single solitary cord passed on from the obliterated point to the pleura, diminishing more and more in volume, whilst from its sides issued secondary filaments, which went dividing and subdividing in the same manner.

There was a remarkable peculiarity, viz. that in the interior of the organ, there came off laterally from these filaments, small, very short, prolongations, and the filaments themselves terminated in the same way.

Pathological and normal anatomy are a mutual support to each other; without the first a crowd of changes of structure, that the morbid state renders more apparent, would have remained unknown; on the other hand, a precise knowledge of the parts in the healthy state can alone enable us to judge of the organic alterations. It now appears to me, that those solid cords are nothing more than the bronchi themselves obliterated, even to their extremities, whatever may have been the cause of obliteration in the point it began at. In its turn, this pathological fact confirms the assertions that we have put forth on the distribution of the bronchial tubes, and their mode of terminating, whether in the interior of the lung, or at its periphery. And nature, in such instance, furnishes us with a most successful anatomical pre-

* The memoir is accompanied by some very accurate and well executed plates, demonstrative of these lesions.—Ed.

paration, and one with which neither our imperfect injections nor our common dissections can compete.

M. Reynaud refers the seat of obliteration to the superior lobes, particularly at their summit. He has met with it but twice in the inferior lobes. He acknowledges to have sought for those obliterations in the upper lobe, as well from its being the part of the lung most liable to morbid lesions, as from the disappointments he has met with in pursuing his researches in the inferior lobe.

State of the obliterated Bronchi.—I have found the bronchi, continues M. Reynaud, as far as they were permeable to air, in a perfectly sound state, as well in regard to structure as to dimensions. Sometimes they were more or less dilated, a fact to be observed in points the most different of the bronchial tree. However, it was more common to meet with this dilatation, when the obliteration existed in the great trunks, and at no great distance from their origin. In one case I have met, the superior and inferior portion of the lung were transformed into many pouches, capable of containing so many walnuts; each one was nothing more than a dilated bronchial tube, suddenly obliterated at about an inch and a half from the root of the bronchi.

I have observed nothing worthy of noting respecting the state of the membranes entering into the composition of the bronchi, their mucous membrane being at one time pale, at another injected. Once in a female who had died of consumption, and in whom a great number of the bronchi of the inferior lobe were obliterated in the middle of their course, their parietes were found somewhat thickened in the neighbourhood of the obliteration, whilst their internal surface was red and covered by an exudation of some consistence. In another case we found the parietes excessively thin, transparent, and unprovided with cartilages, for the space of half an inch, in a bronchus of the third order, in the neighbourhood of the obliteration. The subject had been affected with cancer of the uterus, and was in the last stage of marasmus. The lungs were pale, discoloured, very light, and presented, in a number of points, small tubercles and cancerous masses, and were remarkably rarified at their summit.

State of the Bronchi and of the Pulmonary Tissue in the Neighbourhood of the obliterated Bronchi.—The bronchi in the neighbourhood of the obliteration were often remarkably dilated. Thus, in a case where a bronchus was obliterated at four lines from its summit, the lung being collapsed, a collateral branch was found suddenly dilated to a size far above its natural diameter, and was continued as a small indurated impermeable mass, about one line in thickness at the top of the lung, and directly under the pleura.

Again, we have found this obliteration beginning lower down, that is, nearer to the root of the bronchi than the point of obliteration in a collateral branch, but it is possible that a large tuberculous cavity, which occupied the greatest part of the same lobe, might have influenced the dilatation.

The pulmonary parenchyma, in the neighbourhood of the obliterated bronchi, was frequently found in a remarkable state of emphysema, or even of rarefaction, without any dilatation worthy of notice being observed in the bronchial branches that were lost in it.

But instead of this state of rarefaction, we have observed the pulmonary tissue dense and impermeable. Thus we have seen the postero-inferior part of the upper lobe converted into a number of pouches, to the circumference of which there was no access of air. We have observed this disposition, but in a less degree, near a bronchial branch that had become dilated and afterwards obliterated.

State of the Blood Vessels adjoining to the obliterated Bronchi.—Excepting those cases where extreme dilatation of the bronchi preceded their obliteration, and in which all the neighbouring parts were found more or less compressed, the accompanying blood vessels did not appear obliterated. We could even trace them to a great distance by inflating them. But it was otherwise with the very small branches accompanying the last fibres that went to the obliterated tubes; air could not penetrate them, though blown with the greatest force from a neighbouring trunk, and their dark colour, which made them look like hairs, pointed out the stop to a circulation within them. It is right to mention here, that the filaments of the obliterated bronchi were of a deep black, perhaps owing to the small portion of blood that remained within them having undergone this change of colour after their circulation ceased. As the dark colour is so often met with near the top of the lung, in a great number of its chronic alterations, these remarks may not be useless in determining the anatomical and morbid nature of these alterations.

In the case before we have not directed our attention to the nerves of the lung, their excessive tenuity, preventing our following them to any distance; the same remark applies to the sympathetic vessels.

State of the Cellular Tissue.—As the cellular tissue everywhere tends to occupy the place of atrophied parts, so in the lung it kept the obliterated tubes perfectly distinct; the latter too, by their very dark colour, being easily recognized from the greyish colour of the cellular tissue. This tissue was softer than the parts that lost themselves in it, and if we pulled lightly by the bronchial trunks, there appeared a number of small furrows, owing to the action of those small fibres on a non-resisting tissue, as occurs in dissecting the last ramifications of a nerve; we lose sight of it for a moment, and find it again when we pull lightly by its trunk. It was also more easily broken than the fibrous filaments, and by scraping with the blade of the scalpel, we were able to expose to view the bronchial or vascular filaments, and to exhibit them plainly in water.

Causes of the Obliteration of the Bronchi.—From the properties of mucous membranes generally, and their non-liability to adhesions with each other, we may naturally be somewhat surprised at the frequency of obliteration of the bronchial tubes. There might possibly be reason to suppose that their lining membrane does not enjoy

the same properties as mucous membranes situated in other parts. How much does the fine pellucid membrane (which in the pulmonary parenchyma constitutes almost the only bronchial tegument) differ from that which lines the commencement of the air passages, and still more from the mucous membrane of the digestive canal; their continuity is not a sufficient characteristic to establish their identity.

In the small bronchi we find neither villi nor follicles, and their normal secretion is serous and not mucous; no doubt a *pathological* condition does make a difference in mucous membranes and their secretions: by the same condition a serous cyst may become a mucous pouch, and secrete mucus, or pus; in fact, in all the organs, tissues and organic products, the most various may occur from the same cause. In another point of view the mucous membrane lining the air tubes is much more liable to inflammation than that lining the digestive canal, and I have reason to suppose that the bronchial extremities often present an analogous state. I have met with several cases of acute pneumonia with hepatization, where the lesion given rise to was the production of false membranes lining all the cavities, the inflammation leaving their parietes intact.

The following case will shew that inflammation in the bronchi, particularly in those of small calibre, may cause their obliteration in the same manner, as when it attacks blood vessels.

A man aged twenty-five was attacked by small pox, which went its usual course; the crusts had become detached, and some cicatrices remained, when a pneumo-thorax manifested itself at the right side, accompanied by dyspnœa, dilatation of the affected side, and a sound exceedingly sonorous on percussion. The sole circumstance of a perforation of the pleura, with effusion of air into its cavity, made M. C. A. Louis suppose the existence of pulmonary tubercles; sudden death supervened. A considerable effusion of air had taken place into the pleural cavity, the lung was pressed upwards to the spine, and retained there by recent soft membranes. A perforation of the pleura, near the base of the lung, was observed leading into a cavity filled with pus. Numerous tubercles were found throughout the organ, but they differed somewhat from the usual appearance. By carefully dissecting the small bronchi that led to them, their cavities were found lined with a slightly consistent yet firm layer, red near the roots, and filled in the same manner to their ultimate terminations, where they appeared granular; the blood vessels along their course were completely black, and the pulmonary parenchyma of a dark brown red. There was no hardness, nor semi-transparent grey infiltration, while a great number of small cavities, filled with pus, pervaded the whole lung from base to summit. At the top of the lung, one of those cavities filled with pus, was lined by a whitish membrane, half a line thick, but soft, and separating the cavity from the pulmonary tissue, which was dark brown in its neighbourhood, but farther off was of the usual rose colour, and exempt from tubercles. A bronchus of a large calibre terminated at this cavity, but did not

enter it. In fact, the false membrane lining the cavity had stopped up the mouth of the bronchus, by being prolonged into its cavity to the length of seven lines, and formed a firm layer over the lining membrane, from which it was easily separated. This plastic material presented the same characters as that contained in the small bronchi, which formed by their re-union those masses apparently tuberculous, which we have spoken of above. With respect to the cavity at the top of the lung, the prolongation of its false membrane into the interior of the bronchus, which was inflamed but not ulcerated, amply demonstrated its character and nature.

Now, I am of opinion, that though obliteration of the tubes may be owing to a morbid action in the whole course of the tube, yet that the obliteration may equally occur throughout, if the air cannot pass through it, as we see an artery become obliterated sometime after the circulation in it has ceased, and this would be the more likely to occur in the bronchial tubes, as they do not anastomose, and would be promoted by the pressure of the surrounding parts.

That absorption of the air contained beyond the obliteration may take place, will be proved in the sequel of this memoir. A very remarkable form of the lesion we are describing will be demonstrated by the following case :

At the post mortem examination of a woman who had died in La Pitié, one of the lungs presented the following state. The principal bronchus of the upper lobe, five lines in diameter, was obliterated at about two inches from its origin, but instead of being obliterated from the point of obstruction, and becoming a solid cord, as is usually the case, it swelled out into an oblong ovoid sac, containing a semi-fluid yellowish matter, somewhat like tuberculous matter mixed with mucus. The branches to which this part of the tube gave origin, were obliterated at some lines from their origin, and degenerated into so many fibrous cords, that went on diminishing, until they were lost in the neighbourhood of the pleura. In the whole extent of this bronchus below its obliteration, those orifices which we might have expected to have met with, did not exist, there were merely some circular impervious pittings.

On examining the bronchus externally, there was found to issue from all the points corresponding to these little pittings, solid fibrous cords, which following many ramifications, could be followed into the substance of the organ.

Two of these pittings, however, presented in their centre a slight aperture, leading in one into a portion of a bronchus, four lines in diameter at the broadest, and about twelve lines long; from its extremity three ramifications proceeded, which soon become obliterated into small cords; the dilated portion contained no foreign matter, and was permeable to air. The second aperture led into a bronchial cavity, of very considerable diameter. In its course some branches, permeable to air, continued onward to the pleura. Others, on the contrary, presented infundibula, and then degenerated into cords; but in some of the latter, a dilatation occurred between the two

points of their obliteration, but this dilatation contained an opaque matter. I think it very probable that the disease began in the first bronchus, and that the alteration of which it was the seat was a narrowing more or less gradual, from whence had resulted the obliteration of the greater number of the orifices leading into the bronchi arising from it.

It cannot, in fact, be allowed, that the closing of the orifices was the effect of the obliteration, since we find the same closure at the origin of a bronchus which was dilated and contained a peculiar matter. On the other hand, we find two of these orifices in process of obliteration, since they admitted only the point of a pin, and yet opening into a dilated bronchial cavity permeable to air.

The obliteration of the bronchial tubes in their course cannot then be looked on as a cause of the closure of their orifices in the main trunk. If, on the contrary, we look on the narrowing of the orifices to have been primitive we can easily understand that dilatation of the corresponding bronchi should have occurred before the orifices became closed, the air finding a difficult exit at each expiration; and when the orifices became quite closed, the dilated tube becomes in a manner like a sac containing the mass of secretions, while its minute ramifications became obliterated by the approximation of their parietes, the air within them having been absorbed.

From this view of the facts, the last stage of obliteration must have been that of the previously dilated trunks themselves after the gradual absorption of the secretion they contained. We shall state hereafter our reasons for supposing that this is the mechanism by which those rare cases of tuberculous cavities cicatrize.

I have mentioned the frequent complication of tuberculous development with obliteration of the bronchi. In phthisical patients it is not uncommon to meet in different points of the lung, particularly near the top of it, encysted or free masses, resembling tubercle, soft plaster or dry chalk, varying from the bulk of a pea to that of a walnut. In almost all cases of this sort a careful examination has shown me that the bronchi leading towards the parts of the organ thus affected were obliterated in a great part of their course.

It is difficult to arrive at a perfect knowledge of any organic lesion when we have before our eyes only the last results of it, and that its primitive characters have been long effaced. Now, these chalky masses, or those resembling dried tubercles, are met with in the lungs of phthisical patients, particularly in the aged; are contained in pouches more or less thick, smooth or rough internally, apparently fibrous, and more or less coloured by the black pulmonary matter.

The contents of these pouches were different, sometimes they were like tuberculous matter, and differed from it only in consistence, being more dry and friable; at other times they appeared like a magma of tuberculous matter, suspended, not in a purulent liquid as occurs in recent tuberculous cavities, but in a small portion of water; oftentimes it was like wet plaster; at other times so dry as to crumble between the fingers: again, it was found like chalk, resisting the edge of the

scalpel. It was not unusual to find small portions of a matter as hard as silex in their centre.

This substance was not uniformly yellow, but was occasionally dotted or streaked with black. It was then easy to demonstrate that it was not inorganic, but that a relic of organized tissue entered into its composition; by isolating it it could be traced to the parietes of the pouch with which it was incorporated, and from which it seemed to emanate. We once discovered in the substance of one of these masses a multitude of bronchial branches of a dark black, which after many subdivisions terminated there. The contained matter, as in analogous cases, adhered to the parietes of the cyst.

This chronic alteration of the lung, I surmise, owes its origin to abscess of the lung, or to the breaking up of a more or less considerable tuberculous mass; yet the rarity of abscess of the lung, compared to the frequency of the lesion of which we treat, seems to exclude in the greater number of cases this bond between these two pathological states.

Cavities or cysts containing chalky or soft matters commonly exist at the top of the lung. There seems but little difference between the parietes of the one and the other, or if there be a difference, it is in one being more recent than the other. In both cases we find lesions to point out that one time or another there had existed an inflammatory process.

It is almost impossible to give an opinion as to the substance contained in the cavity or in the cyst, the shades are so finely drawn; for the tuberculous matter, when deprived of its water, resembles moist plaster or chalk.

In both cases we find in the middle of the tuberculous matter, or that filling the cysts, remains of organic tissue, indicating a destruction more or less ancient of the pulmonary parenchyma.

As to the wrinkling or depressions on the surface of the lung, it is a fact observed in both cases, for this state of the surface indicates merely a retreat of the pulmonary tissue, whether from the condensation of the matter of a cyst, or by absorption of its more fluid parts, and Laennec has observed a similar state of the surface of the lung in some rare cases of cicatrization of ulcers of that organ.

From these considerations we are led to admit that one of these alterations is the termination of the other, and that it is also one mode of cure of ulcers or tuberculous cavities of the lung. The cure in these cases, and I mean only local disorder, would be effected not by cicatrization; but, *first*, because the softened tuberculous matter, retained by whatsoever cause, would not leave in its place a fistulous cavity, and tending constantly to enlarge by a purely ulcerative process, brings on in phthisis new disorders independently of those which result from the softening of new tuberculous masses. *Secondly*, because the tuberculous matter, having become an encysted foreign body, could be considered only in the light of an inert substance, submitted to the laws of interstitial absorption, and of the chemical combinations rendered possible by the nature of its elements.

If this be so we can understand why this disposition is more frequently met with in the autopsies of the old than of the young; the latter being carried off before any reparatory process can be accomplished, and the former presenting organic alterations which require a long time for their production.

With these views one will conceive of what importance should be the obliteration of the bronchi opening into accidental cavities, for such an effect to be produced. Is such an obliteration primitive or consecutive?

The smaller bronchi, like the smaller vessels, situated in the neighbourhood of cavities or abscesses of the lung, are obliterated by the process which, in the first instance, causes softening of tubercles, and in the second suppuration. The false membrane which lines them passes always in front of their opening. I have very often observed in their interior, but particularly in the vessels, a small cylinder of plastic matter which closed them like a stopper: a fact observed in vessels of even a large size, but never in large bronchi. The latter open into the cavities, sometimes ulcerated and cut unevenly, sometimes their parietes are continuous with the dense and firm tissue lining the parietes of the cavities, and which are covered by a non-organized whitish and soft tissue. I have not observed a sufficient number of abscesses of the lung to know the condition of the bronchi with respect to them. In one case the lining membrane of the abscess was continuous with, and caused obliteration of, the principal bronchus.

I have not made sufficient observations with regard to the obliteration of the bronchi in phthisis to offer an opinion respecting them; neither can I affirm any thing respecting the date of those obliterations in the neighbourhood of tuberculous cavities. With respect to the occurrence of this lesion in the neighbourhood of abscesses, the occlusion seems to be the effect of continuous inflammation. I might offer a conjecture that the same occurs in certain cases where the inflammatory process attends the softening of tubercles.

Physiological Effects of Obliteration of the Bronchi.—If obliteration exist in any branch of the vascular system the circulation can be continued collaterally, and even into the obliterated trunk below the point of obliteration. But the passage of air can never occur beyond the point of obliteration in a bronchus, as there is no collateral communication between its branches, consequently, there is a diminution, for so far, in the extent of respiratory surface equivalent to the portion of the organ rendered impermeable to the air. On the other hand, the inspiratory effort not being diminished has the effect of dilating the parts in the neighbourhood of the obliteration. Hence, a new cause of diminution of the respiratory surface, which is the more great the more the bronchi become dilated and the pulmonary tissue rarified. This applies to any impediment to the introduction of air in any part of the lung whatever. Hitherto auscultation has not led to many discoveries with respect to the lesion in question.

The symptoms too are referable to other diseases as well as to the present one.

Obliteration of the Bronchi by a Substance formed and accumulated in their Interior.—What I have to say on this head applies exclusively to the small bronchi and their extremities. In fact, I have never met with obliteration of the large tubes from matter secreted within them, unless in cases where by approximation of their sides this accumulation was induced. On the contrary, I have often dissected small bronchial tubes, and found them distended by a more or less solid substance.

Sometimes the seat of the obliteration was confined to one point, the matter being in a mass more or less round, at other times forming a perfect cast of the tube and its ramifications, and reaching to their terminal *culs de sac* or the pulmonary vesicles. When this latter disposition occurred, it was found to occupy only one branch or all the branches which together constitute a lobe, giving an altered and variable appearance to the pulmonary parenchyma. In this latter case it was not from the external appearance of the lung or any slice of it that we could determine the precise seat and nature of the alteration; it was necessary to dissect each little bronchus in particular to arrive at the fact, that it was from the reunion of the different bronchi thus altered and obliterated that the general alteration resulted.

This matter existing in the bronchi, and obliterating their cavities more or less completely, sometimes presented the appearance of tuberculous matter, at other times that of the plastic substance, the effect of inflammation of the mucous membranes, but particularly that of croup. In the first case, the lesion of the lung, which was the consequence of it, presented the characters of tubercular phthisis; whether, being isolated, it gave rise to granulations, or that more extended it constituted a form of tubercular infiltration. In the second case, there resulted from it a form of pneumonia or hepatization which has not been described, and which I ought here to take notice of.

A man, æt. 35, died in La Pitié, after a rapid acute pneumonia. The left lung was entirely hepatized, the top of the organ alone being free from alterations. On cutting into the lung its tissue was red, interspersed with yellow and black patches here and there. In some portions the colour was uniformly grey, or like pus. The organ, covered by a recent yellow false membrane, did not collapse on opening the chest; its density and specific weight might be compared to that of the liver; it was completely deprived of air and broke under the finger. By these characters it was easy to recognize the second stage of pneumonia and its passage into the third or suppurative stage. So far the lung presented nothing that could make it be distinguished from other lungs in the stage of red or grey hepatization; but closer attention discovered consistent cylinders projecting from the interior of the bronchi of the second and third order, as is often seen occur with respect to the discoloured coagula observed in blood-vessels, and for which at first sight these were mistaken. As this

matter formed, in the interior of the bronchi, solid cylinders which penetrated all their divisions, it could be taken out in a very arborescent form, the perfect cast of the bronchial ramification itself. At a short distance from the periphery of the organ these branches of plastic matter did not fail to present the arborescent appearance, and by careful dissection might be followed to the terminal vesicles within half an inch of the pleura, where there appeared on them small lateral swellings, round, regular, at first isolated, afterwards more numerous, so that they appeared festooned on their borders. Some of these projections occurred at only one side, and in this particular instance they gave off other and more numerous bulbs, presenting the appearance of bunches of grapes. A very slight pulling on the principal cord from which they sprung sufficed to remove them without any dissection of the cavities which contained them.

According as we approached closer to the pleura, the little cylinders of which we have spoken became divided into branches, shorter, more numerous, and swollen at their extremity, so as to appear knotty; and immediately under the pleura they appeared in form and colour similar to those granules that are observed in some of the forms of hepatization of the lung, which this patient exhibited in the highest degree.

This appearance was not only observable on the surface of the lung, but internally and on all the points of the incised surface. All the bronchi that were examined were in the same state as those I have described. The smaller the bronchi were the more full were they; thus in the branches the plastic matter did not occupy two-thirds of their calibre, while their terminations were accurately filled in their whole diameter.

The contained substance resembled in its external characters those of fibrine; it was of a slightly yellowish white, resisting, elastic, and capable of being separated into filaments. It appeared in the microscope to be composed of a multitude of uncoloured and perfectly round globules, like those of the blood, excepting that in the terminations of the tubes where it was grey or of a dirty black colour. This matter differed in appearance in those parts of the lung affected with the second and with the third stage of pneumonia. In the latter the filaments were much more moist, less resisting and thinner, and filled less exactly the cavities of the tubes.

The bronchial parietes offered nothing remarkable either in colour or thickness; some tore with more facility than would be expected in the healthy state; towards their terminations their colour was similar to the contained matter.

The vessels were completely empty, their parietes white, and there was no trace of inflammation on their surface. Pathological research will ultimately throw much light on this subject; and the last case has proved the important fact, viz. that the branches of the bronchi do not anastomose.

Products, the result of different morbid alterations, lead us to

think that the plastic lymph, the inflammatory pseudo-membranes, the solid part of the blood, the fibrine itself retained in the vessels by whatsoever cause, may, under a certain special influence, assume forms independent of any organic operation. Let us inquire what would have become of this plastic matter if the patients had lived under the influence of a tuberculous or cancerous diathesis? Might not a pneumonia have brought on in a phthisical patient a transformation, such as that in which the lung seems converted into a compact tuberculous mass. Such a state is not rare in children, and it is very often met with in monkeys, which are, of all animals, those that are most subject in our climate to pulmonary phthisis.

The following case, which is chiefly characterized by the obliteration of the bronchi, deserves a place here; it occurred in a patient of M. Louis.

The left lung adhered throughout its whole extent to the costal pleura, and to the bag of the pericardium; the pulmonary pleura of the upper lobe formed with the subjacent cellular tissue a greyish white layer a line and a half thick.

A longitudinal incision showed the upper half of this lobe hollowed into a vast cavity; the remainder of its extent was a compact mass of a yellowish white and sufficiently firm, appearing smooth where it was cut, but granular where torn, breaking under the finger, and preserving in no point a vesicular structure. With the exception of some few vessels and bronchi of large size, there was no trace of blood vessels or permeable bronchi; partitions of a white colour proceeding from the pleura divided the tissue of the lung into a mesh-work by their numerous ramifications.

The bronchi at their roots were free; but when they diminished to the size of a crow-quill, they contained a cast of yellowish white matter; this continued to their ultimate subdivisions, but when the latter became more minute the plastic matter became so confounded with their parietes that they appeared as one mass; yet, on pressing a portion of this part of the lung between the fingers, a matter oozed out sufficiently firm to be caught hold of by a forceps and extracted in a cylindrical form. This substance, where it was first traceable, was soft and its colour whiter than that of parenchyma. According as you approached the last extremities of the bronchi it became firmer, its colour yellow or grey, and similar to that of the contiguous parts. The parietes presented no redness, farther on they were transformed into tuberculous matter, and preserved nothing of their original character but the cylindrical form.

The large vascular trunks contained no clot; their orifices were ovoid, and were surrounded by a greyish circle.

In the upper part of the lung where the cavity was situated, the indurated and thickened cellular tissue formed the envelope. The corresponding surface of the inferior lobe formed its parietes downwards and inwards. Internally there was no false membrane, but merely the softened pulmonary tissue, as if macerated; several fragments of this tissue, the size of a walnut, were hanging and nearly de-

tached ; some of the bronchi, as if dissected, hung loose and floating in the cavity. All these branches when cut into transversely were empty near their roots ; farther on they were filled with coagula, their parietes being rendered very thick by the addition of a layer of reddish coloured tissue.

I can find no more appropriate title for the alteration that I have just described than that of tuberculous croup of the smaller bronchi and their terminating vesicles. In the preceding details we have found the bronchial cavities obliterated by a solid matter which filled them exactly at a certain distance from their origin, and preserved the form of the tube ; in like manner those cylinders filled the minute bronchi more exactly than elsewhere, while the parietes of the latter underwent a transformation in their texture which rendered them similar in appearance to the contained matter. But it deserves to be noticed, that in the larger bronchi this matter has not the tuberculous aspect, and rather resembles the plastic matter which constitutes the usual false membranes.

Obliteration of the Bronchi by Compression.—Though there are numerous causes tending to impede the passage of air through the tubes by compression of their parietes, I shall confine myself to those cases where compression has caused complete obliteration of their cavities. We know that a tumour of whatsoever sort cannot be developed in the midst of the parenchyma without compressing the small bronchial tubes in its neighbourhood, and more or less obliterating them. Dilatation of the bronchi, when arrived at a certain extent, has the same effects. There are examples of obliteration of the bronchi being caused by the pressure of calculous matters not larger than a small pea. I am uncertain whether obliteration of the small tubes is found to keep pace with that development described by Bayle, under the name of granular phthisis. Obliteration from such a cause does not seem to occur in the large bronchi or their first branches ; yet I have seen, in the dissection of a monkey, a tuberculous tumour developed around the root of the principal bronchus of one lung and obliterating its cavity. This monkey died of phthisis ; tubercles existed in the lungs, liver, spleen, epiploön, and bronchial ganglions, and there was a mass of them in the interior of the pericardium.

The left side of the chest was narrowed ; the lung of the same side completely void of air, and pressed upwards against the vertebral column in a manner similar to that caused by an effusion of fluid in the cavity of the pleura. There existed no trace of liquid, and the pleura was perfectly healthy. There was no adhesion, old or recent, on its surface. On attempting to inflate the lungs by a pipe introduced into the windpipe, the right lung alone became dilated. It was only on introducing the pipe into the left branch, and blowing very strongly, that I succeeded in forcing in a very small quantity of air. It was then evident that an obstacle existed somewhere in this bronchus. It was found to be owing to a mass of tuberculous ganglions surrounding the tube in its whole circumference, nearly as the prostate surrounds the

canal of the urethra. This mass, by its development inwards, had flattened the bronchus, and effaced its cavity. The obliteration extended half an inch, and there was just so much of a slit open as to admit the very narrow blade of a scalpel; beyond that the bronchus was of the natural diameter; and instead of finding within it a thin mucus mixed with bubbles of air, there was only a reddish glairy non-aerated mucus, similar to that often found in the neck of the uterus.

One may ask, if the obstacle to the admission of air also prevented the return of it, what became of the air which at the moment of complete obliteration should have been incarcerated? The only answer is, that it is most probable that the air was insensibly absorbed, which possibly, may occur even in the healthy state, by the internal surface of the bronchi and their numberless ramifications, and as we observe occurs in emphysema of the cellular tissue in all parts of the body.

The first deduction from this fact I refer to what I have said in the first part of this work, concerning the obliteration of the smaller bronchi by *approximation of their sides after the air retained beyond the first obstruction had been absorbed*.

A second remark may arise from the narrowing of the chest from obliteration of the principal bronchus of a lung. The ribs being obliged to follow the lung become at length sunken from the absolute void in the pleural sac, as they would after the absorption of an effused fluid in the same cavity. Though I have never met with the latter disposition in man, the fact I have related, though borrowed from comparative pathological anatomy, may call the attentions of physicians to the point.—*Memoires de l'Academie Royale de Medecine*. Tom. iv. 2 Fascic. 1835.

PHYSIOLOGY.

Confirmation of Purkinje's Discovery of Vibratory Motions.—In conjunction with Dr. Rainy of the University of Glasgow, I examined the respiratory mucous membrane of the rabbit, immediately after the death of the animal, in order to detect the vibratile motion described by Drs. Purkinje and Valentin of Breslaw, on the surface. We used a lens of the twentieth of an inch focus, but we did not discover any motion on the surface of the mucous membrane of the trachea, or of the Schneiderian membrane. We then examined the mucous membrane of the oviduct of the hen, and observed most distinctly a current in the surrounding water, produced by a waving motion on the surface of the mucous membrane. The motion, however, was not so distinctly vibratile as that observed on the surface of the gills of the bivalva mollusca, and other animals, and so well described by Dr. Sharpey of Edinburgh. We remarked that the motion was most distinct about the middle of the oviduct.

THOS. WHARTON JONES.

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